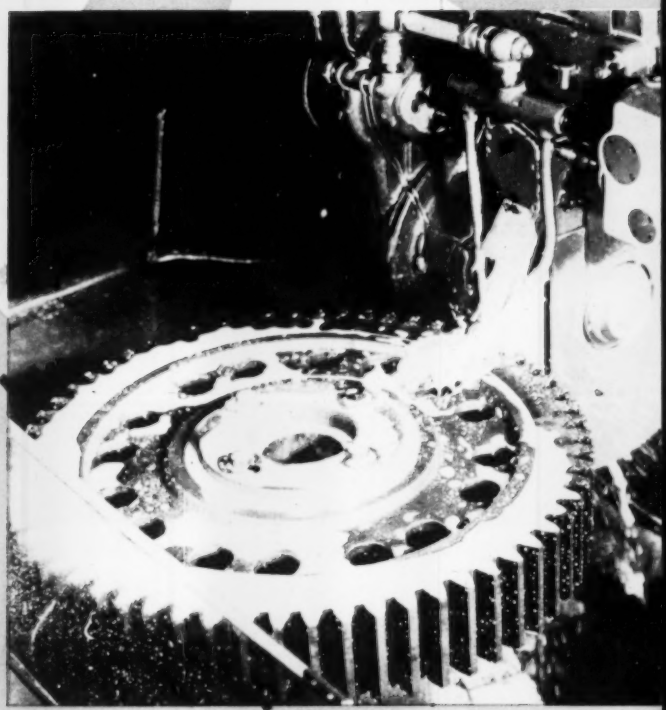
AUGUST 13, 1951

STEEL

THE WEEKLY MAGAZINE OF METALWORKING

GEARS
Shift Into High



FOURTH QUARTER STEEL ALLOTMENTS
—Double Trouble Ahead, p. 45

SHORT OF ALLOY STEELS?
—Ceramics May Be The Answer, p. 74

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8 *Important Features of* **EC&M** *Magnetic Control*

1 Time-Current Acceleration
2 Line-Arc Contactors
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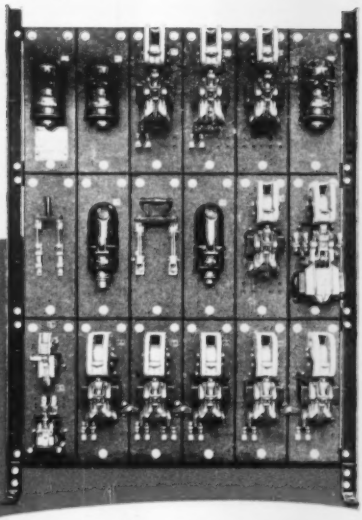
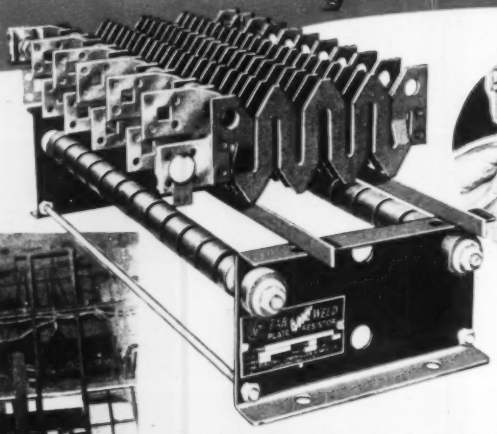
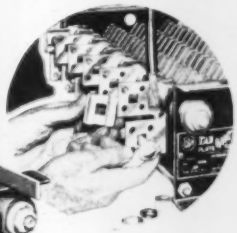
7 Bolted, Welded Frame
8 Quick Contact Renewing

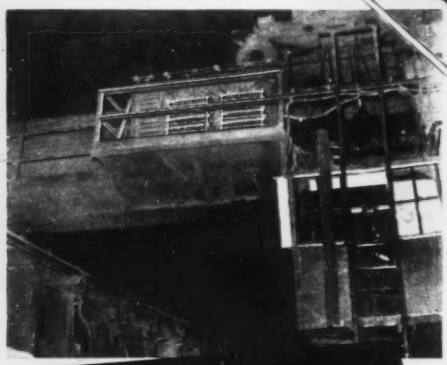


Save on upkeep with TAB-WELD PLATE RESISTORS





To shift the external lead-wire, only the terminal-block need be moved. The terminal-blocks are grooved to accommodate several sizes of wire, or flat-bus may be bolted to the terminal-plates.



TAB-WELDS SAVE UP TO ⅙ ON UPKEEP

Control purchasers like the plus value in EC&M TAB-WELD Plate Resistors. No burning at grid-eyes or at tap-plates and, as shown in the circle view, simplified tap-shifting when shifting taps is needed for improved performance.

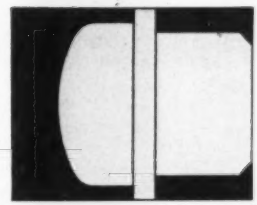
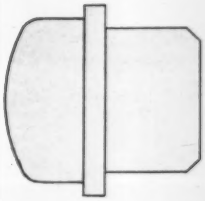
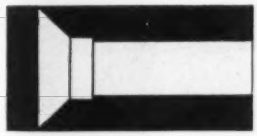
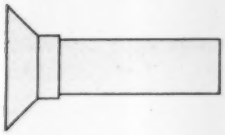
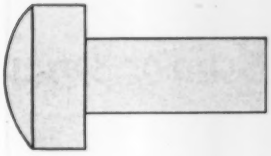
There's no need to fear that failure to tighten end-clamping nuts will cause damage by burning. Also, there's more time for the maintenance crew to inspect, check, adjust and maintain other units of the drive.

Make your own layouts with Bulletin 942-A TAB-WELD Resistors. They will pay for themselves quickly through reduced upkeep expense.

E&M

THE ELECTRIC CONTROLLER & MFG. CO.
2698 EAST 79TH STREET • CLEVELAND 4, OHIO

Cold-Heading Saves Steel

MACHINED	COLD-HEADED	STEEL SAVED
		45%
		73%
		61%

Data Courtesy of American Machinist

More steel products are being cold-headed than ever before. And for good reasons. It's not at all unusual, for example, to save over 50 pct in material and labor by cold-heading on products that would otherwise be made on screw machines or by milling operations.

Until fairly recently only the softer steels were suitable for cold-heading. But today even steels of medium-high carbon content are being cold-headed with notable success. As a result, many products are being redesigned so as to take advantage of the savings in steel and the lower production costs that cold-heading so often makes possible.

Supplying cold-heading wire is a Bethlehem specialty. In our modern wire mills we give special attention to cold-heading wire because it must be able to take a lot of punishment—upsetting, extrusion, slotting, punching, trimming, pointing, and other operations performed by cold-heading machines.

Proper internal soundness and freedom from injurious surface imperfections are of special importance because the heading or forging operation may cause even minor flaws to open up into wide cracks. Surface finish, accurate size, and uniformity of composition are some of the other details that we watch carefully in making cold-heading wire.

Call on our technical staff for assistance when you have a problem involving steel wire—for cold-heading or any other use.

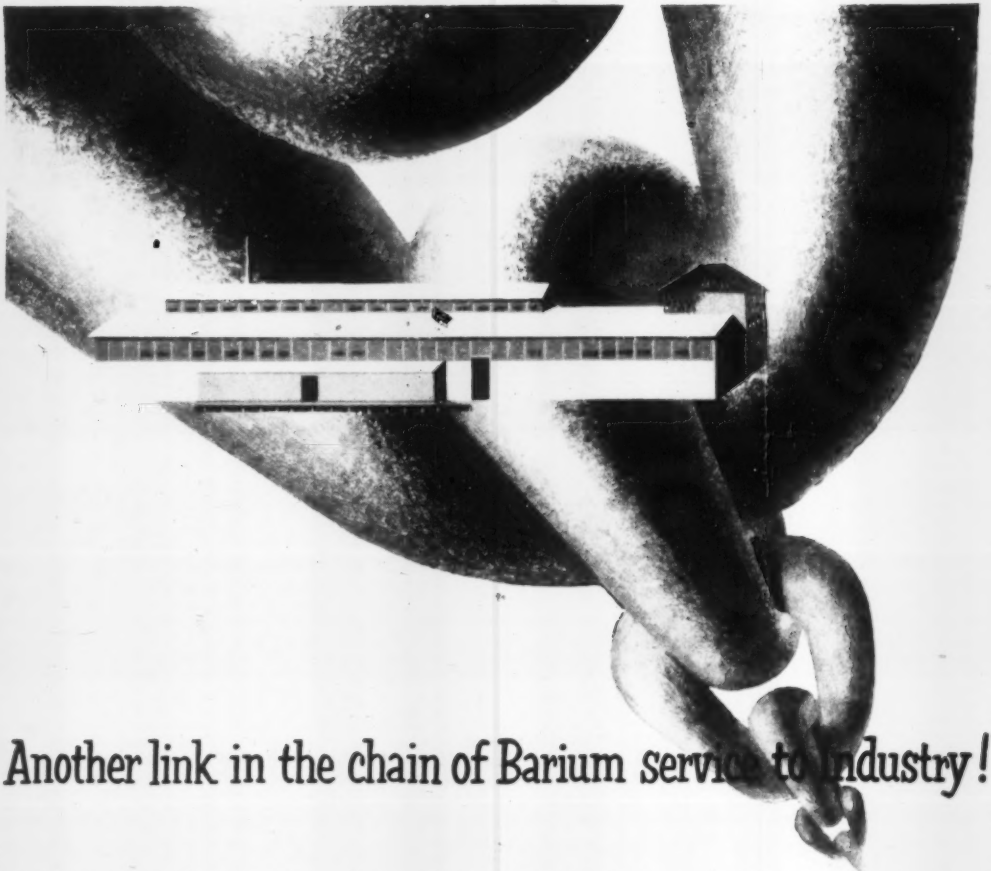
BETHLEHEM STEEL COMPANY

BETHLEHEM, PA.

On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation. Export Distributor: Bethlehem Steel Export Corporation

BETHLEHEM WIRE

★ BETHLEHEM STEEL ★



Another link in the chain of Barium service to industry!

HERE'S AN IMPORTANT LINK in the chain of Barium subsidiaries supplying industry with steel in many forms.

It's Bayonne Bolt Corporation, producer of nuts, rivets and related steel products.

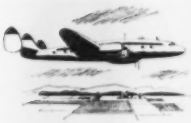
Because Bayonne is part of Barium, you benefit. For Barium Steel Corporation is a team of strategically located companies working closely together, bringing joint knowledge to bear to solve your steel problems. It's a single source controlling quality from blast furnace to finished product . . . ready to work as a self-contained unit to speed urgently needed orders.

At no obligation, put Barium ingenuity to work for you . . . on plate, structurals, fabrications, forgings, stampings, springs, bolts, nuts. Address Barium at 25 Broad Street, New York City.

BAYONNE BOLT CORP. • CENTRAL IRON AND STEEL CO.
CHESTER BLAST FURNACE • CLYDE IRON WORKS, INC.
CUYAHOGA SPRING CO. • ERIE BOLT AND NUT CO.
GEOMETRIC STAMPING CO. • GLOBE FORGE, INC.
INDUSTRIAL FORGE AND STEEL, INC. • JACOBS AIRCRAFT ENGINE CORPORATION • KERMATH MFG. CO. • KERMATH LIMITED (CANADA) • PHOENIX BRIDGE CO. • PHOENIX IRON AND STEEL CO. • WILEY MANUFACTURING CO.

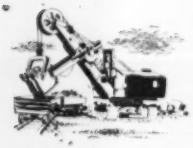
For Logging

For Sand and Gravel



For Aircraft

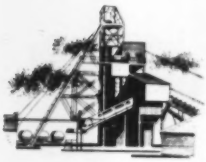
For Marine



For Stone Quarries

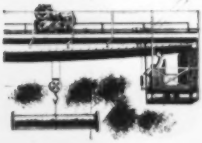
For Construction

For Elevators



For Mining

For Drilling



For Industrial

For better service and more economy

MACWHYTE

PREformed... Internally Lubricated

WIRE ROPE

A thousand and one **to order from assures the right rope for your equipment**

It will pay you to get Macwhyte Wire Rope, engineered and job-proved for your particular equipment. Over the years, ropes for all types of equipment in every field have been developed by Macwhyte. Recommendations are promptly available from Macwhyte distributors or Macwhyte Company. You get the correct wire rope for your equipment when you buy Macwhyte.

MACWHYTE COMPANY

KENOSHA, WIS.

MACWHYTE COMPANY, 2912 Fourteenth Avenue, Kenosha, Wis. Manufacturers of Internally Lubricated PREformed Wire Rope, Braided Wire Rope Slings, Aircraft Cables and Assemblies, Monel Metal and Stainless Steel Wire Rope. Catalog available on request. Mill depots: New York • Pittsburgh • Chicago • Minneapolis • Fort Worth • Portland • Seattle • San Francisco • Los Angeles • Distributors throughout U.S.A.

BULLETIN 5025 gives information on "How to order Wire Rope" and lists all sizes and constructions of Improved Plow Steel Monarch Whyte Strand Wire Rope. Copy sent on request.

1009

This is another of the "HUNDREDS OF JOBS" which can be done on a MARVEL Band Saw!

MARVEL BAND SAW saved these two 4400 lb. castings

Two sand cores washed out when these giant 4400 pound steel connecting rods were cast, resulting in solid eye ends without gaps. Then came the $64 question—how to machine out the 1½" slots in the longitudinal center of the eyes which were 22" high and had a wall thickness of 6½".

The Ernest J. Nelson Iron Works of San Francisco, did this "impossible" job easily, quickly, and economically, without special tooling, on a standard Model #8M/2 MARVEL Band Saw. Two cuts were made in each rod in two hours per cut with tool cost of $3.06 per rod. The tool was a MARVEL B9-10 Band Saw Blade.

Every tool room, machine shop and maintenance department needs a MARVEL Series 8 Universal Band Saw—not only for innumerable everyday jobs but for the occasional "trick" operations, where its utmost versatility will save many headaches and dollars.

WRITE FOR CATALOG

MARVEL *Metal Cutting* SAWS

These exclusive MARVEL Features made this job easy.

1. Large, T-slotted work table.
2. Blade feeds into work vertically; work always stationary.
3. Power-pressure feed.
4. Automatic Blade tension.
5. Built-in coolant system.
6. Large capacity.

ARMSTRONG-BLUM MFG. CO.

5700 BLOOMINGDALE AVENUE **CHICAGO 39, ILLINOIS**

SHOW CATALOG

STEEL
The Weekly Magazine of Metalworking

VOL. 129 NO. 7 AUGUST 13, 1951

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Next Week ... **Winning and Keeping Skilled Labor** ... **Nickel Shortage Shifts Focus to Type 430 Stainless** ... **Assemblies Produced Economically by Brazing and Soldering** ... **Aircraft Parts Stretch-Formed on Conventional Presses**

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Lapping Carbide 20% Faster!

Carbide spray nozzle orifices are finished to tolerances of .0005" at Spraying Systems Company, Bellwood, Illinois. New Elgin DYMO-C diamond abrasive used in place of diamond powder-oil mixture produces more pieces per hour and conserves diamond, too!

ELGIN DYMO-C*
diamond abrasives
*C FOR CARBIDE

Here is a complete new diamond abrasive specially prepared to speed carbide finishing operations. It cuts faster, won't work back on the lap, won't settle and comes ready to use without time-consuming mixing. Write for complete information—ask for a free demonstration.

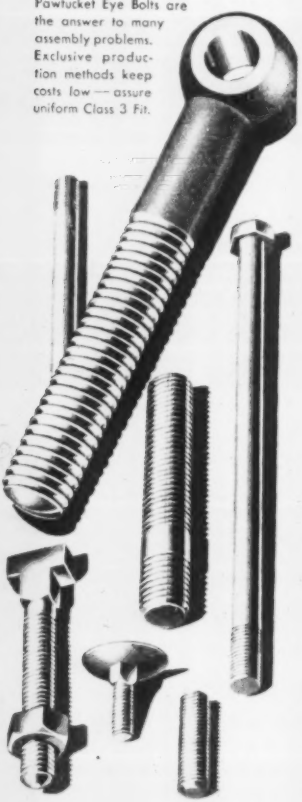
ALL ELGIN DIAMOND ABRASIVES ARE COMPLETELY PRODUCED BY ELGIN AND CERTIFIED TO CONFORM TO U.S. BUREAU OF STANDARDS SPECIFICATIONS.

ABRASIVES DIVISION
ELGIN NATIONAL WATCH CO.
ELGIN, ILLINOIS

Looking for specialties

EYE BOLTS

Accurately made in sizes 1/4" and larger, or to your specifications, Pawtucket Eye Bolts are the answer to many assembly problems. Exclusive production methods keep costs low — assure uniform Class 3 Fit.



BETTER BOLTS SINCE 1882

Use Headed and Threaded Fasteners for Economy and Reliability

PAWTUCKET

"THE BOLT MAN"

MANUFACTURING COMPANY

327 Pine Street · Pawtucket, R. I.

THE PLACE TO SOLVE YOUR BOLT PROBLEMS

T.M. REG.

Behind the Scenes...

The Farm Life

If you have a hankering for the farm, but are tied to your job with XYZ Metalworking Co., perhaps you can solve your problem like Jack Trantin Jr. did. He's president of Youngstown Alloy Casting Corp. in Youngstown.

His company built a new plant on a 5.5 acre site, leaving considerable vacant property around the factory for expansion. "Since we won't need it right away, we might as well farm it," said Trantin. He set out a rose garden with more than 600 bushes in the front yard. Next, he had excavators scoop out a hole for a duck pond in the back yard. He bought 102 ducks and six geese for the pond, and also a flock of 360 chickens.

He also set out 70 trees, including apples, pears, plums, apricots, cherries and others. Other land around the plant has been planted with soy beans, clover and alfalfa to improve the soil.

One thing's bothering Trantin, though. He's afraid his plant will have to expand so rapidly that much of his farm will have to be plowed under.

Hay Fever Season

Since we are now sneezing unhappily away, along with thousands of other hay fever sufferers, we read with interest Funk & Wagnalls' new *Your Hay Fever and What To Do About It.*

Author Harry Swartz M. D. says that the total number of working days lost by the hay fever population is an estimated 5.5 million. That figure is based on only the group of patients receiving treatment. He says that if figures were available for the hay fever population not receiving treatment, the loss in workdays would be doubled or tripled.

"Hay fever is an enemy to industrial production," says Dr. Swartz. And something should be done about it. It's an enemy to writing production, too. KERCHOOOOOOO!!! And something should be done about it.

Off the Fat of the Land

One of Chain Belt Co.'s products is working on the fat of the land. For years, the Milwaukee company produced its concrete pumping equipment for just such use—moving concrete through pipe lines on large construction jobs.

But a slick new use has been discovered. A Cincinnati meat packing firm, E. Kahns' Sons Co., adapted a concrete pumper for transporting pork fat from the cutting floor to the lard rendering department. That saves the manual trucking which accounted for 80 or 90 per cent of the total direct labor cost.

It Must Be the Heat

Have the engineers yet figured out a way to air condition elevators? If so, the conversion hasn't been done on the elevators in at least one Cleveland department store. We were riding in one the other day, along with a dozen or so other perspiring people. The operator was listlessly droning on about the merchandise found on each floor.

We were relieved when she called, "Main floor, everybody out, please." All of us trooped out like a bunch of sheep, milled dazedly around in front of the elevator for several moments until one stout lady exclaimed, "Why this here's not the main floor! It's the third."

She was right. The elevator operator blushed as red as her uniform as we all filed back in.

Puzzle Corner

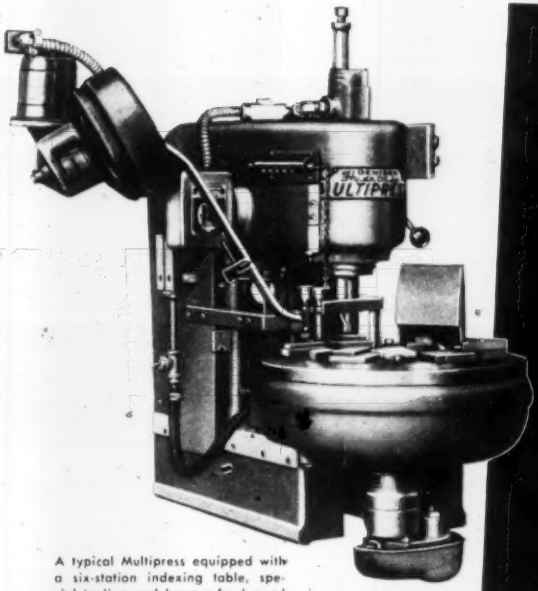
The 66-pound fish that the fisherman weighed without conventional scales in the July 30 problem was caught with bait no more unusual than a worm. Several of the people who answered that puzzle correctly inquired, so we thought we'd pass the information along. Expert fish-weighers were E. Buschow of Surface Combustion Corp., Robert H. McGrath of National Tool Builders' Association, C. E. Blass of Talon Inc., J. A. Bamberger of Kramer Trenton Co., Lloyd J. Brenna of Kennedy Tank & Mfg. Co., Ralph Pappenheimer of Specialty Device Co., James F. O'Neill of Westinghouse Electric Corp., Donald E. Jackson of Emsco Derrick & Equipment Co. and Robert W. Huff of Canton, O.

In the Land of Aa there are only two classes of people—huntsmen and noblemen. Noblemen always tell the truth and huntsmen always lie.

Three citizens were walking one day when the first made a remark identifying himself as one of the two classes. The second said, "He says he's a nobleman." The third said, "No, he's a huntsman." To what class did each belong?

Shrdlu

(Metalworking Outlook—Page 37)



A typical Multipress equipped with a six-station indexing table, special tooling and hopper feed, used to rivet electrical contacts on brass and spring steel contact arms.

MULTIPRESS is the answer to FASTER BETTER SAFER PRODUCTION for hundreds of operations

With Accurate Pressure Control Plus Wide-Range Adjustability, Multipress Offers Unique Production Advantages

SMOOTH, ACCURATE, OIL-HYDRAULIC ACTION, specially engineered for production speed and efficiency, plus quick, easy, wide-range adjustability! That's what enables Multipress to make cost-cutting news on so many different types of jobs!

More than *six-thousand Multipresses* now offer working proof of this ability to speed production, improve quality, reduce rejects and scrap losses, increase safety, cut worker fatigue, reduce die wear, and slash costs.

A quick review of a few Multipress features will show why!

Pressure is infinitely adjustable, within the full pressure range of the press.

Pressing and approach speeds can be adjusted separately, to combine rapid traverse with controlled working speeds.

Ram stroke can be preset for either distance or pressure limits.

Controls for time delay, or ram dwell, and many sequence requirements are available.

Exclusive Multipress Vibratory Ram Action—ram effort applied in a series of short, rapid, full-tonnage strokes in each cycle—is also available.

Multipress can be equipped for either manual or automatic ram control, with dual levers or push buttons for extra safety.

Highly compact Multipress design requires minimum floor space and head room . . . gives maximum advantage in locating parts bins, tote boxes, hopper feeds, conveyor equipment, and other accessories.

Indexing tables and dial feed tables for feeding parts to the press ram automatically, are standard Multipress accessories. Others include harmonic stock feed, straightening fixtures, pelleting equipment, and a foil marking attachment.

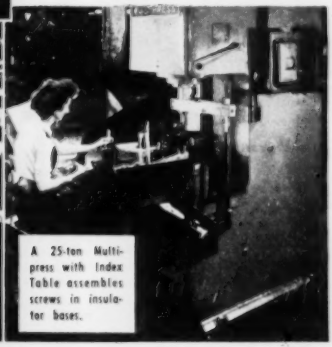
• • • •

Multipress is tailored to individual production needs, in eight different frame sizes, with capacities from 1 ton up to the 50-ton range. For more information, write The Denison Engineering Company, 1163 Dublin Road, Columbus 16, Ohio.

DENISON Hydr-OIL-ics

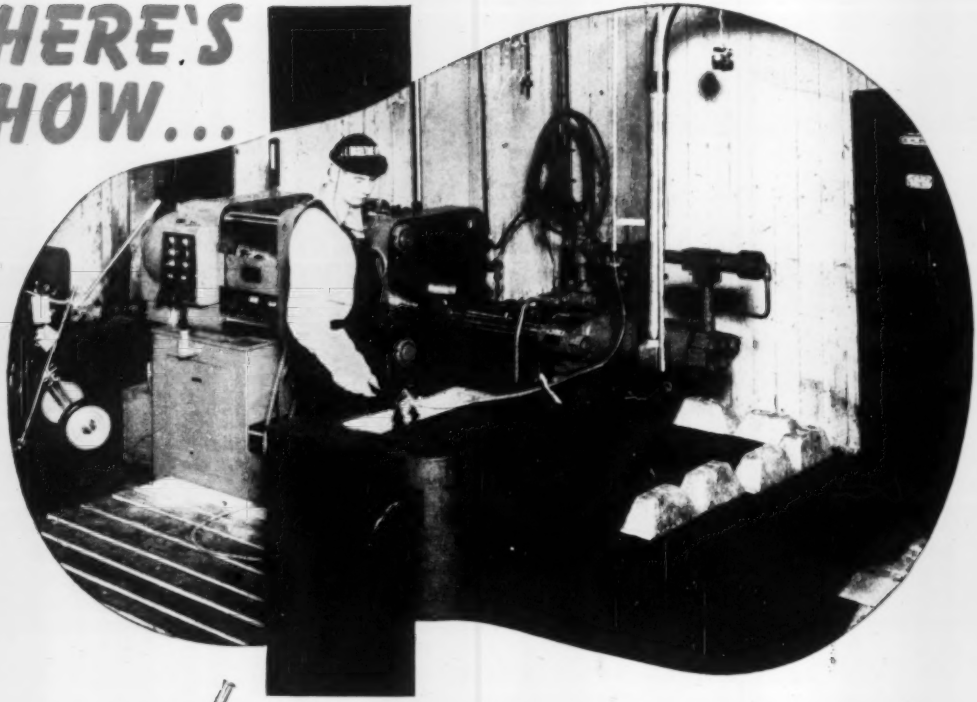
8-ton Multipress used by famous radio maker in producing speaker assemblies.

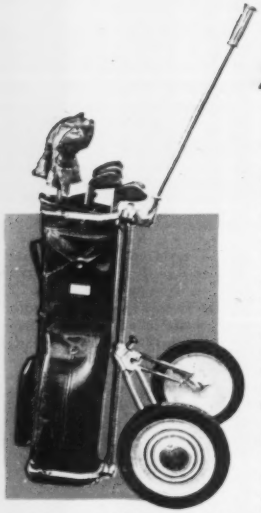
A 4-ton Multipress with Index Table broaches serrations on small cams.



A 25-ton Multipress with Index Table assembles screws in insulator bases.

HERE'S HOW...





Consult your Lindberg-Fisher representative for recommendations on your production problems.

Bag Boy® MANUFACTURERS INCREASED PRODUCTION RATE 5 TIMES

. . . with the LINDBERG-Fisher 2-Chamber Furnace

Jarman-Williamson, Portland, Oregon, manufacturers of BAG-BOY—the folding golf cart, utilize the Lindberg-Fisher 2-Chamber Melting Furnace in casting 14 parts for the BAG-BOY. Here's their story as they told it to us:

"Deluxe wheels on our BAG-BOY were becoming a bottleneck. When we used a sand cast wheel, one man on an 8-hour shift averaged 108 wheels—(MACHINING TIME ALONE)! We installed a Lindberg-Fisher 2-Chamber induction furnace as a running mate to our H.P.M. die casting machine. Management policy of buying the best for the job has already paid off—the nine-inch wheel is hitting the assembly line at the rate of 100 an hour. Using a 1¼ lb. shot at a temperature of 1180°F, rejects are less than 5%. We're running 180 lbs. of metal through the furnace an hour (including trimmings, scraps, etc.) with no appreciable temperature variation from the necessary 1180°F! This keeps our unit operating at peak performance. The operator does not depend on test shots or 'feel'.

"As our operation has been running for only a short time it's too early to set up operation cost figures, but we do have some interesting facts: 1) Production rate is five times greater than the previous method; 2) During the weekend idling period, the furnace holds 500 lbs. of aluminum molten for 62 hours on 456 KW, which in Portland costs $4.62; 3) In one day, we charged 1440 lbs. of metal—and removed it at the rate of 3 lbs. per minute from the ladling side—no temperature variation could be noted; 4) We get a high percentage of good castings with comparatively inexperienced help. Our two operators made their first shots on this machine—within 30 minutes good castings were on their way to the production line. To a great extent this is attributable to the constant temperature maintained by our Lindberg-Fisher; 5) Our furnace is within arms reach of the shot well, allowing easier, smoother operation. This is possible only because of the extremely low heat loss from the furnace, which adds materially to the operators comfort and efficiency.

This sums up the fact that to date we are enormously pleased with our purchase. The Lindberg-Fisher induction furnace is proving all that was claimed for it by its representatives."

LINDBERG-Fisher MELTING FURNACES

LINDBERG ENGINEERING COMPANY • 2441 West Hubbard Street, Chicago 12, Illinois

26 MILLION TONS of steel scrap "ain't hay"

IT took 57,000 tons of steel to build the Empire State Building in New York. That's about one-tenth of one percent of the tonnage of scrap required to produce the new steel demanded for America's defense and civilian needs this year.

Half of this scrap is produced by the steel mills themselves. The other half - approximately 26 million tons - must be supplied by the public. That tremendous tonnage is the equivalent of 461 Empire State Buildings - over 1400 carloads of scrap every day of the year.

Right now there is a scrap shortage. It threatens to interfere with steel production. So we appeal to you, as a user of steel and steel products, to do all you can personally to help collect scrap.

Somewhere in your place of business - and even at home - there are things that can be scrapped - worn-out or obsolete machines, pipe, boilers, tools, structural parts, etc., that you'll never use again in their present form. Turn them in through regular channels. Call the nearest dealer and start your scrap on its way to the steel mills - to help America reach its production goal of 105 million tons of new steel in 1951. It is this team-work that will help us win the victory again.

YOUR SCRAP IS NEEDED — YOUNGSTOWN

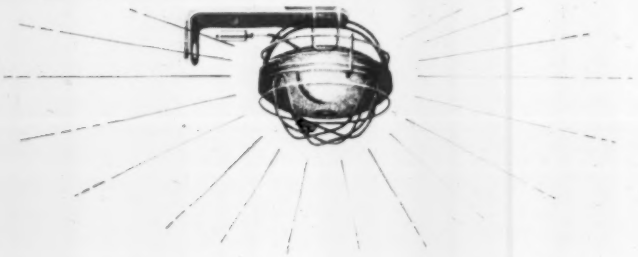
The Youngstown Sheet and Tube Company

General Offices -- Youngstown 1, Ohio

Export Offices -- 500 Fifth Avenue, New York

MANUFACTURERS OF CARBON ALLOY AND YOLOY STEELS

The steel industry is using all its resources to produce more steel, but it needs your help and needs it now. Turn in your scrap, through your regular sources, at the earliest possible moment.



THE FIRE WATCH THAT NEVER SLEEPS

ARE you ready for fire *when* it strikes? Week ends? Nights? During shut downs? Put a Kidde Automatic Fire Extinguisher System on the job—it's *always* on the alert against fire.

The heat from a fire hits the Kidde detector . . . sends a signal that releases flame-smothering carbon dioxide automatically. Such a system can protect a single space . . . or many spaces throughout the plant.

Wherever a hazard exists—in engine rooms, fuel storage rooms, document vaults, electrical equipment—you can depend on fire-sensitive, fast-acting Kidde automatic or manual systems to protect your property. Call on us for full information.

Kidde

Walter Kidde & Company, Inc.

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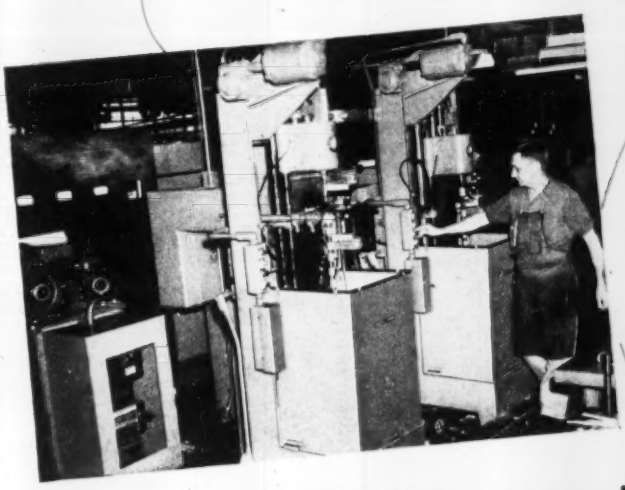
WHICH OF THESE HEAT-TREATING PROBLEMS IS YOURS?



Cost Reduction?
Increased Production Rates?
Quality Control?
Reducing Distortion?
Production-Line Heating?
Floor Space?

WESTINGHOUSE RF HEATING HELPED SACO-LOWELL SOLVE ALL SIX

Saco-Lowell Shops, makers of outstanding textile machinery, had always experienced problems with hardened bottom front rolls.

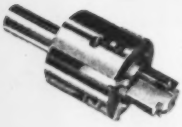
A Westinghouse 50 KW—450 KC RF Generator, with two standard vertical scanners, helped increase line production rates by 145% with total annual savings of $13,300.00. Direct labor costs have been cut 63%. Journal bearings are now ground after hardening, producing a higher quality roll. Formerly, every shaft required straightening; now this operation has been simplified and costs here reduced 70%.

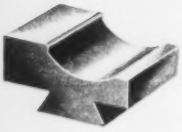
Look at the results obtained by Saco-Lowell with a Westinghouse process that can handle *132* different rolls. Examine your heat treating problems. They, too, may be reduced, clarified, or eliminated entirely. Write to Westinghouse Electric Corporation, Induction Heating Section, 2519 Wilkens Avenue, Baltimore 3, Maryland. Write today.

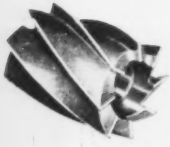
J-02226

YOU CAN BE SURE...IF IT'S
Westinghouse
INDUCTION HEATING

with Gorham-ENGINEERED SPECIAL CUTTING TOOLS







Next time you're up against a tough tooling problem, call in the man who can give you *the right answers fast* . . . your nearby Gorham Field Engineer! He's an expert in special cutting tools . . . and he's ready to provide a complete engineering service to determine your exact tooling requirements. He starts with your product, sketch or idea. He surveys your production operations and available equipment. He considers work material properties and desired finishes and tolerances. He plots proper machine feed, speed and method of tool driving. Then he develops practical design and engineering specifications for special cutting tools, metallurgically "tailor-made" for your application.

His recommendations are backed by Gorham's unmatched facilities, which include three fully-equipped modern plants, a large Engineering and Metallurgical staff, and a force of field application engineers in principal industrial centers, coast-to-coast. All are dedicated to furnishing prompt and profitable solutions to your special tooling problems. Gorham-engineered "specials" are turning problems into profits in thousands of plants every day . . . why not let them do the same for *you?* If you haven't met your nearby Gorham Field Engineer, write for his name, or send details of your problem direct for recommendations.

Gorham TOOL COMPANY

"EVERYTHING IN STANDARD AND SPECIAL CUTTING TOOLS"

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LETTERS
TO THE EDITORS

They're Still Available

We think STEEL's digest of the Controlled Materials Plan (A Guide to CMP, June 25, p. 55) was the best explanation we've seen. If reprints are still available, we can use a dozen copies.

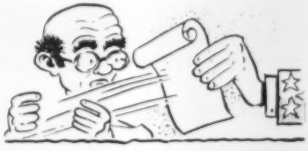
Edmond P. Severn
vice president, sales
Continental Steel Corp.
Kokomo, Ind.

I am interested in the series of articles on the fundamentals of steelmaking that were published in steel beginning in 1948 (ABC's of Iron & Steel, Dec. 20, 1948—Aug. 14, 1950). If these articles, numbered consecutively, 1-27, are available I will appreciate your forwarding them to me.

M. P. Pote
Johannesburg, South Africa

• *Reprints are available for both these* STEEL *features from Readers Service Department, Penton Publishing Co., Cleveland 13. ABC's of Iron & Steel is reprinted in bound volume, priced at $10 a copy. The Guide To CMP is 50 cents a single copy.*

Why Rescue Inventors?



Referring to your item, "To the Rescue of Inventors," (June 18, p. 50) I fail to see the injustice in the government's claims to all inventions rising out of research and development work financed by the government.

That is exactly the kind of contract private industry makes with those it employs in research and development work that it finances.

Michael Borushko, technical director
Harding Mfg. Co. Inc.
Detroit

Filters: A New Type

We are interested particularly in the type of air filter described in your item, "Fine Filtering" (STEEL, July 9, p. 71). What firm manufactures the product?

Seth E. Winslow
Walton Laboratories
Irvington, N. J.

• *Manufacturer is Cambridge Corp., 350 S. Geddes St., Syracuse, N. Y.*

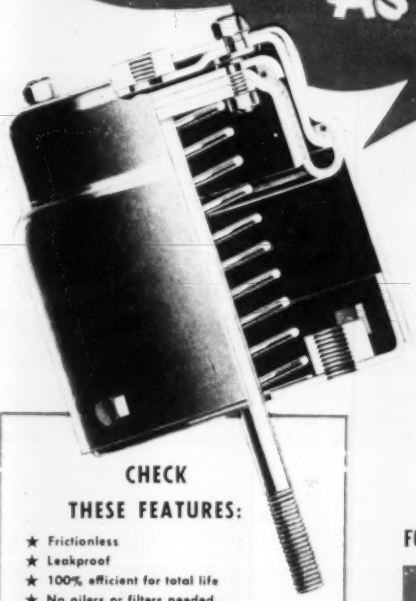
Latest Specification

I note an article by J. B. Walker, Navy Bureau of Ships, that predicts modernization of naval hull plate specifications (STEEL, June 11, p. 81). The new specification has been issued under the number MIL-S-16113.

R. H. Lambert, Captain, USN
Philadelphia Naval Shipyard
Philadelphia

ON OLD OR NEW MACHINE TOOL OPERATIONS—

YOU CAN STEP UP YOUR PRODUCTION AS MUCH AS 30%



....WITH THIS SIMPLE, RUGGED, LOW COST AIR CYLINDER!

The pressure for production is on! Manufacturers everywhere find it increasingly difficult to keep pace with the demands of the day. But there is a way—a brand new way requiring no addition to manpower, no addition to plant facilities. The answer? Remarkable Bendix-Westinghouse Robotair Industrial Controls. With their wide range of applications, Robotair controls offer you amazing improvements in production speed and economy through increased productivity of man and machine at *unbelievably low initial cost*. Robotair units are available as original equipment for machinery manufacturers or for easy installation on shop equipment.

Send today for an informative booklet and find out how you can cut costs, speed production with Robotair! Address Bendix-Westinghouse Automotive Air Brake Co., Dept. G, Elyria, Ohio.

CHECK THESE FEATURES:

- ★ Frictionless
- ★ Leakproof
- ★ 100% efficient for total life
- ★ No oilers or filters needed
- ★ Holding pressures up to 5000 lbs.
- ★ Diaphragm has rolling action and exceptionally long life
- ★ Made from high grade steel stamping—all metal parts cadmium plated
- ★ Chrome Molybdenum Steel Push Rod heat-treated for maximum toughness
- ★ Easily installed

FOR HOLDING, CLAMPING, BENDING, SWEDGING, STAKING, RIVETING

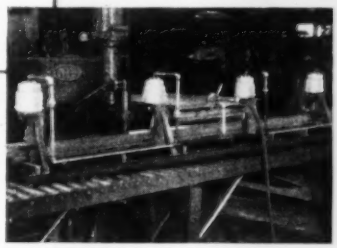
ROBOTAIR

THE INDUSTRIAL AIR CONTROL OF A THOUSAND USES

BENDIX-WESTINGHOUSE ROBOTAIR

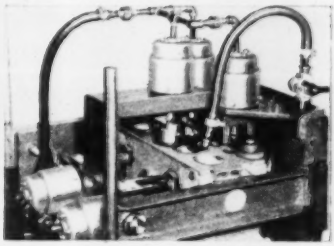
Bendix-Westinghouse

Bendix-Westinghouse Automotive Air Brake Company Elyria, Ohio



REDUCES OPERATOR FATIGUE

Four Rotochambers installed on the fixture in this spot welding operation replaced cumbersome hand clamps, saving time, greatly reducing operator fatigue.



SPEEDS INSPECTION METHODS

Installation of Rotochambers on this water test operation for engine castings eliminated hand operated fixtures, thereby speeding inspection and cutting costs.

This thickness control screw, made from STRESSPROOF steel bar, is a vital part of the asphalt road layer shown laying an air strip at a Pacific base.

COSTS DOWN 25% PRODUCTION UP 100%

WHEN STRESSPROOF® REPLACED HEAT-TREATED .40 CARBON ALLOY STEEL BARS

- *Speeded Machining 50% to 100%*
- *Eliminated need for Heat Treated Alloy Bars*

In this asphalt road layer, instead of using a heat-treated, hot-rolled .40 carbon alloy bar, STRESSPROOF was specified. STRESSPROOF provided *in-the-bar* the necessary strength and wear resistance, and machined so much easier that production time was cut in half.

STRESSPROOF's unique combination of four important qualities *in-the-bar* is cutting costs and speeding production on many similar defense jobs. STRESSPROOF is twice as strong as ordinary cold-finished bars. Its resistance to wear often makes carburizing unnecessary. It is stress-relieved to minimize distortion, and has *in-the-bar* machinability fully 50% better than heat-treated alloys of the same hardness. Yet STRESSPROOF is less expensive than all cold-finished and most hot-rolled alloy steel bars that have been fully heat treated.

STRESSPROOF is also available with a Ground and Polished finish.

LASALLE STEEL CO.
1414 150th Street, Hammond, Indiana
Manufacturers of the Most Complete Line of Cold-Finished and Ground and Polished Bars in America

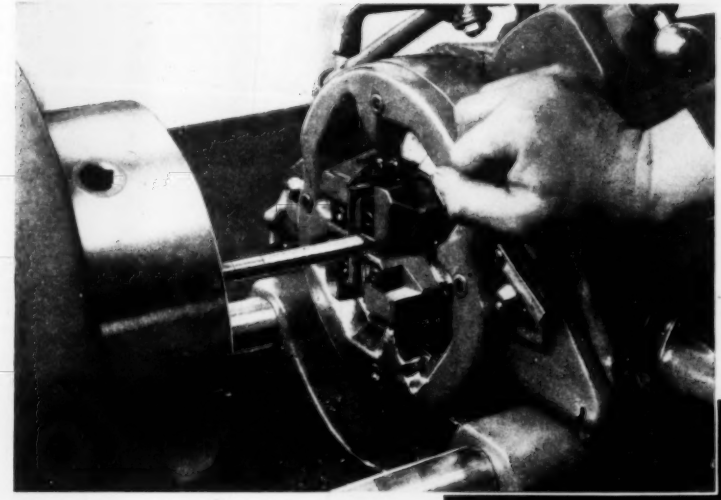
La Salle
STRESSPROOF®
SEVERELY COLD-WORKED, FURNACE-TREATED CARBON STEEL BARS

STRESSPROOF IS PLAYING A VITAL ROLE IN NATIONAL DEFENSE!

A very large proportion of STRESSPROOF production, today, is going into defense jobs. However, from time to time sample bars may be available for testing purposes.

Little Landis

PIPE THREADING & CUTTING MACHINE

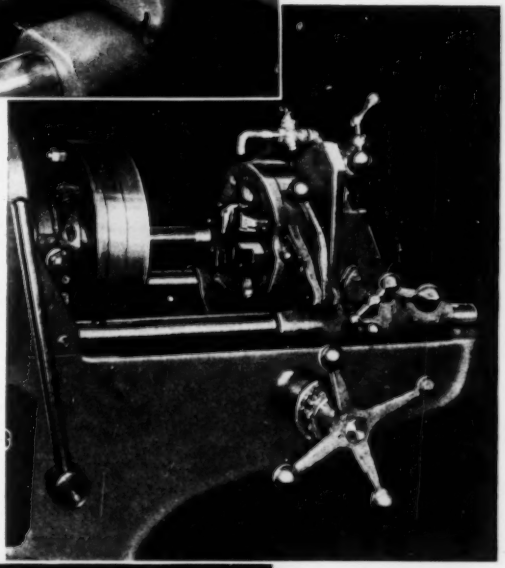


FOR

Maintenance

AND

Jobbing



● The LITTLE LANDIS Pipe Threading and Cutting Machine is designed for threading bolts and for cutting off and threading pipe in jobbing and maintenance shops. In the illustrations on this page, the 2" LITTLE LANDIS is producing bolt threads for use in maintenance work.

The LITTLE LANDIS can handle a variety of work at a minimum cost, permit the quickest possible set-up changes, and produce cleanly-cut and well-formed threads on all materials. It uses the Landis Chaser, the only pipe threading die with the same free-cutting action and natural clearance of a lathe tool. This allows for long life between chaser grindings and smooth finish and accuracy in the finished thread.

Write for Bulletin C-82

LANDIS MACHINE CO.

WAYNESBORO, PA., U.S.A.

LANDIS

New Aircomatic® Welding Process cuts materials cost 25% ... saves 4½ hours time

MARTIN QUAID CO., of Philadelphia, Pa., wanted to reduce the time and cost of welding huge stainless steel cylinders used in the manufacture of carpets . . . without affecting the quality of the finished product.

Dana V. Wilcox. Airco Technical Service Specialist, was called in. He recommended the use of Airco's new Aircomatic process. The cylinder to be welded was 15' 4" long with an O.D. of 34¾", and a wall thickness of .093 Type 304 stainless steel. After establishing the wire speed to be used in the Aircomatic process, the weld was performed in a total elapsed time of 1½ hours—4½ hours faster than the former method used.

The operation consumed 6½ pounds of Aireo Type 316 stainless steel wire, and 35 c.f.h. of Airco high quality inert gas—all at 25% below the cost of materials used in the old procedure. The customer was well satisfied and now uses the Aircomatic process for fabricating stainless steel as well as aluminum.

If you are interested in applying the Aircomatic process to a particular aluminum, aluminum or silicon bronze, stainless or nickel clad steel fabrication problem of your own, we will be glad to offer technical assistance. If you would like to receive a descriptive bulletin on Aircomatic welding, please write your nearest Airco office for a copy of ADC-661A.

AIRCO

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REPRESENTED INTERNATIONALLY BY AIRCO COMPANY INTERNATIONAL
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news about AIRCO products

AIRCO HORNET 36A D-C WELDER

The "Hornet 36A" Arc Welder is a heavy-duty, light-weight machine designed to furnish smooth, steady current for every DC arc welding job.

The "36A" features simplified control of current output by means of a sturdy hand-wheel mounted on the control cabinet. Close calibration of the current dial eliminates the need for meters. Easy reversal of the polarity of the welding terminals is provided by a sturdy polarity switch. 200, 300 and 400 ampere sizes are available.

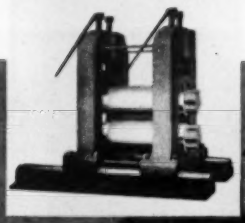
AIRCO HELIWELDING EQUIPMENT

All high capacity Heliweld holders are water-cooled to provide sufficient cooling for high currents used. There's the Air-Cooled Manual Holder for light, general-purpose work . . . the Water-Cooled Manual Holder for heavier, general-purpose work . . . the Machine Holder for semi-automatic installations . . . the Automatic Head for the fully automatic operations. Also available is a Heliweld "Bumblebee" for AC heliwelding. This machine has all controls for current, gas and water within its housing, PLUS a one unit power supply.

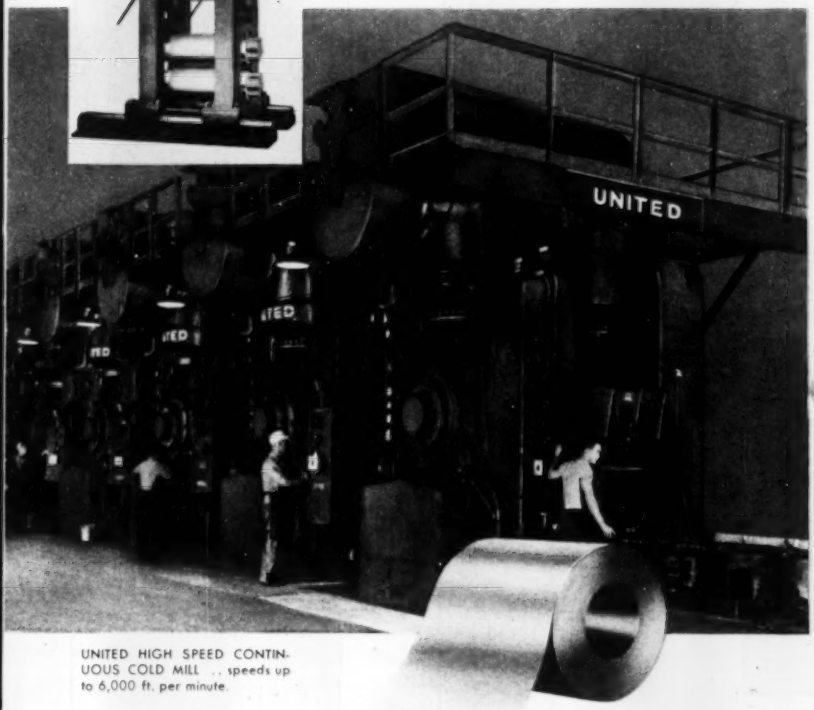
For more information, write your nearest Airco office today for a free copy of Heliwelding Catalog No. 9.

* * *

Air Reduction supplies Oxygen, Acetylene and other industrial gases . . . Calcium Carbide . . . and a complete line of gas cutting machines, gas welding apparatus and supplies, plus arc welders, electrodes and accessories. Ask us about anything pertaining to gas welding and cutting, and arc welding . . . we'll be glad to help you.



EARLY COLD MILL . . . about 1901



UNITED HIGH SPEED CONTINUOUS COLD MILL . . . speeds up to 6,000 ft. per minute.

50 YEARS AGO

Designers and Builders of Ferrous and Non-Ferrous Rolling Mills, Mill Rolls, Auxiliary Mill and Processing Equipment, Presses and other heavy machinery. Manufacturers of Iron, Nodular Iron and Steel Castings and Weldments.

Mom Did Most of the Canning

BUT not any more. Today, the world's choicest foods, with all their goodness and flavor locked in neat, sanitary tins, reach our pantry shelves in infinite variety and abundance.

The phenomenal growth of the canning industry—America's largest user of tin plate—would not have been possible without the development of new and better steel rolling and coating processes.

In the contributions to better living that United has been able to make through a half century of pioneering in the design and construction of more efficient rolling equipment, it takes great satisfaction.

As always, United's engineers will be glad to work with you on your plans for increased tin plate production.

Golden Anniversary
1901 1951

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Pittsburgh, Pennsylvania

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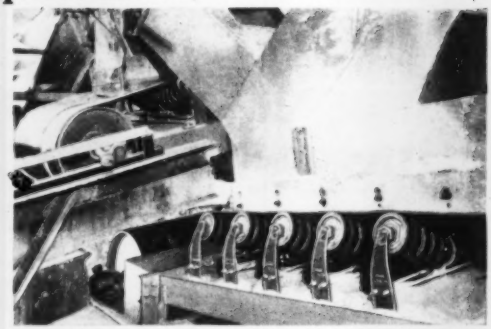
LINK-BELT engineering experience...

GYPSUM ROCK is carried at rate of 500 tph from ship's side to open yard storage by 30-inch Link-Belt Belt Conveyors.

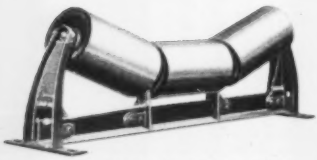


JUNCTION OF Link-Belt Belt Conveyors, showing rubber-tread impact idlers at loading points and welded steel foot pulleys.

Plus LINK-BELT quality components...

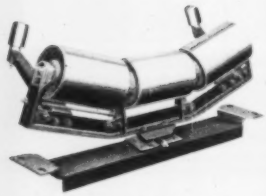
...add up to your best bet in

BELT CONVEYORS



SERIES 100 TROUGHED BELT IDLERS. Strong, balanced integral rolls revolve on high-grade roller bearings. Grease-in, dirt-out seal, large reservoir preserve lubricant.

RUBBER-TREAD IMPACT IDLER for loading points protects the belt by absorbing the shock of heavy materials or lumps delivered from above.



BELT-TRAINING IDLER for automatic belt positioning. The actuating rolls respond to slightest contact — quickly recede and center the belt to minimize wear.

WHAT'S your materials handling problem? Tonnage, distance or a combination of the two? Heavy or light materials? Large lumps or fines? Continuous or intermittent operation?

Whatever the conditions, you'll find the right answers at Link-Belt. For Link-Belt designs conveyor systems to meet your requirements. Backed by unmatched materials handling and power transmission experience, our conveyor specialists help you and your consultants get the right equipment in the right place.

One Source—One Responsibility

Link-Belt makes all the various elements — all types and sizes of idlers, takeups, pulleys, trippers, bearings and power transmission drives. Plus all related equipment — other types of conveyors, feeders, elevators, car dumpers and shakers.

And Link-Belt will build your supporting structures and enclosures . . . install the job completely. One source — one responsibility. Every detail receives the proper attention to assure you an efficient, trouble-free, long-life conveying system.

The next time you need belt conveyor engineering assistance, call the Link-Belt specialist in our office near you.

LINK-BELT

BELT CONVEYOR EQUIPMENT

LINK-BELT COMPANY: Chicago 9, Indianapolis 6, Philadelphia 40, Atlanta, Houston 1, Minneapolis 5, San Francisco 24, Los Angeles 33, Seattle 4, Toronto 8, Springs (South Africa). Offices in principal cities.

"YOU CAN'T BEAT READING COPPER TUBING FOR UNIFORM HIGH QUALITY AND FAST, SURE DELIVERY!"

For a dependable source of supply . . . specify Reading brass and copper tubing . . . processed from the basic metal to the finished tubing in one of America's finest completely integrated mills.

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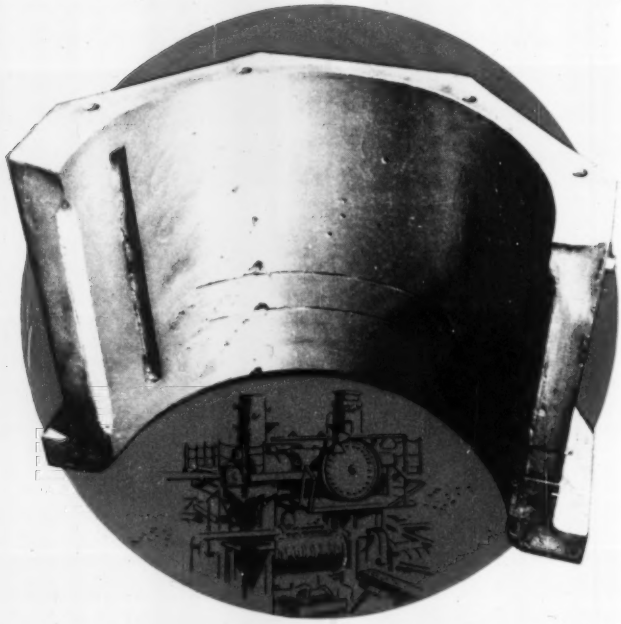


Price: $.00029 Per Rolled Ton!

How National Bearing Division helps its customers lick costly maintenance problems

If there's one thing tougher than rolling mill service, it's the bearing you see above. This bearing was completely designed—from the inside out—by National Bearing Division and installed on a trial basis by one of the country's largest steel producers.

Result? Where the service life of bearings previously used averaged just 13 weeks, this bearing ran exactly 16 months and 4 days . . . rolling 1,315,000 tons! Maintenance expenses—including costs of replacement and down-time—were cut right to the bone.

This record-breaking performance was made possible through a special design by National Bearing Division . . . a design involving alloy, bore, grease grooves, babbitt pockets and machining procedure. And, performance of these bearings is so consistently outstanding that the same mill now standardizes on their use.

We're proud of examples like this—because they show how effectively our facilities for Alloy Research and Engineering—combined with 75 years of practical application experience—make money-saving solutions to problems on . . .

Non-Ferrous Bearings and Castings—
As-Cast or Machined

Bronze Bars—
As-Cast or Machined; Cored, Solid, Hexagon

Babbitt Metals—
For every type of bearing service

AMERICAN Brake Shoe COMPANY

NATIONAL BEARING DIVISION

4925 Manchester Avenue • St. Louis 10, Mo.

PLANTS IN: ST. LOUIS, MO. • MEADVILLE, PA. • NILES, OHIO • PORTSMOUTH, VA. • ST. PAUL, MINN. • CHICAGO, ILL.

BRIDGE MODERNIZATION AT CAIRO

SYMBOL OF ILLINOIS CENTRAL'S PROGRESSIVE SERVICE

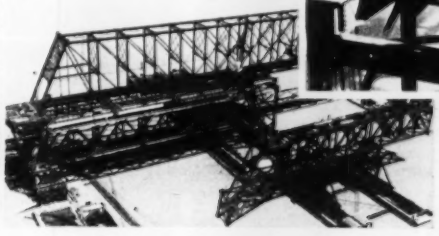
• This is the 100th anniversary of one of America's great railroads—the Illinois Central.

The year 1951 will also see the completion of a new steel superstructure for the Illinois Central's bridge over the Ohio River at Cairo, Illinois.

Twelve modern spans will replace a 61 year old, nine span structure, to accommodate today's heavier, faster traffic. American Bridge Company, because of its skill, know-how and wide experience, was the logical choice to perform the major construction feat of building the new superstructure on the original piers with a minimum interruption in traffic.

The first old span of the bridge was rolled off its piers onto temporary falsework and the new 518-foot, 1,700-ton span moved into position and opened to service after a traffic interruption of only 20 hours! Then the old span was launched like a ship into the river 100 feet below for easy removal.

While this is the first time this procedure has been used on a job of such magnitude, it is a typical example of the part American Bridge Company is playing to help our vital railroad systems meet the needs of growing America.



FOOT BY FOOT the old span, 60-ft. high and weighing 1,100 tons, is rolled over to rest on launching sleds atop temporary falsework. From this position it was launched into the Ohio 100 ft. below. **LEFT:** Falsework span No. 2 erected complete and jacked to elevation prior to floating. FAR LEFT: New span rolls into position four hours after movement started.

INTERESTING FACTS

- 6 spans, 197' 7"
- 4 spans, 518' 11"
- 2 spans, 400' 11½"
- Bridge was single track, through truss. Steel used: 10,000 tons.
- Erecting procedure: Illinois Central R. R. and American Bridge Company.
- Consulting Engineers: Modjeski and Masters.

AVAILABLE NOW! *For showing in churches, schools, clubs and industries, the new sound and color motion picture—BUILDING FOR THE NATIONS—a candid, factual photographic record in full color of the highlights of the fabrication and erection of the United Nations' Secretariat Building in New York City.*

AMERICAN BRIDGE COMPANY

General Offices: Frick Building, Pittsburgh, Pa.

Contracting Offices in: AMBRIDGE · BALTIMORE · BOSTON · CHICAGO · CINCINNATI · CLEVELAND · DENVER · DETROIT · DULUTH · ELMIRA · GARY · MINNEAPOLIS NEW YORK · PHILADELPHIA · PITTSBURGH · PORTLAND, ORE. · ST. LOUIS · SAN FRANCISCO · TRENTON

UNITED STATES STEEL EXPORT COMPANY, NEW YORK

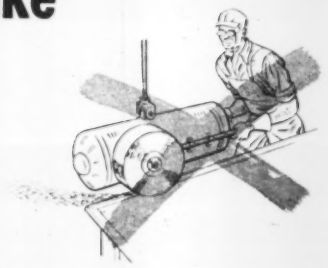
USS TRADE MARK

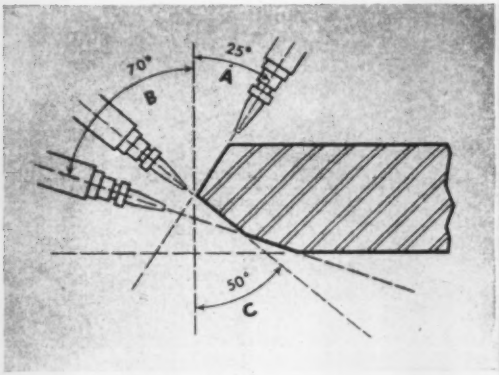
AMERICAN BRIDGE

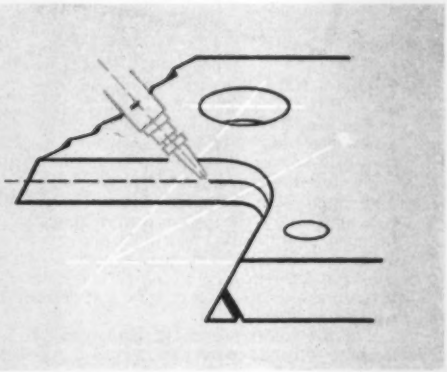
UNITED STATES STEEL

No more grinding edges like these on *armor plate!*

Now—the Acetogen Process allows you to flame-cut the most difficult bevels on armor plate to exact tolerance—and slash the cost of plate-edge preparation by many dollars per ton.







At last, *precision* flame-cutting of armor plate is a reality! Because of its startling accuracy, versatility, and operating characteristics, the Acetogen Process drastically slashes plate-edge preparation costs!

YOU SAVE MAN HOURS! Intricate bevels and cuts need no longer be slowly ground—they can be quickly flame-cut to ±1/16" tolerance.

YOU SAVE CAPITAL INVESTMENT! You don't need large, expensive grinding machines, or elaborate paraphernalia. The Acetogen Process utilizes standard, readily-available, low-cost equipment and tools.

YOU SAVE TRAINING TIME! Experienced flame-cutters become qualified Acetogen operators within a few days. Novices learn quicker, too, because Acetogen gas is docile, easy to use, dependable.

YOU SAVE FLOOR SPACE! You don't need a whole department devoted to grinding. The *complete* job is done in your Acetogen-cutting department.

YOU SAVE HANDLING COSTS! No need to move heavy plates from cutter to grinder; Acetogen does the job in *one* department, and with little moving of plates.

The most convincing proof of these statements comes from some of the nation's top companies—Henry Disston & Sons, Inc.; Baldwin-Lima-Hamilton Corporation; Fitzgibbons Boiler Co., Inc. These companies have continually been amazed at the speed, precision, *and economy* of the Acetogen Process.

Why not put Acetogen to work cutting *your* armor plate? We will act either as consultants, or as sub-contractors doing the entire job in your plant. *We invite your inquiry.* Acetogen Fabricators, Inc., 822 Commercial Trust Bldg., Philadelphia 2, Pa.

YOU GET THESE SPECIAL BENEFITS ONLY WITH THE ACETOGEN PROCESS

- Armor plate of all thicknesses flame-cut to ±1/16" tolerance!
- Acetogen-cut plates are ready for welding without costly grinding, finishing, bridging, or beading!
- Single- and multi-bevels are as easy to flame-cut as square-edges!
- Acetogen-cut plates have "feather" edges . . . surfaces have sufficiently low Brinell to allow machining.

ACETOGEN FABRICATORS, INC. *Originators of precision flame-cutting*

Skilled help for your defense work is available!

● Today we can't offer immediate delivery on new machine tools. But we do offer skilled help—our 45 Warner & Swasey Field Engineers.

If yours is a typical metalworking plant—with machines averaging 10 or more years of age—chances are you need this help to increase the productivity of your machines.

Perhaps one of our Field Engineers can help you. His suggestions may be surprisingly simple—a new part, a different tool, an easy-to-make adjustment. But when he leaves your plant, your machines undoubtedly will be producing more than when he came in.

This is not a war-born service. The Warner & Swasey man who calls on you was *trained* for this job. He has helped increase production in hundreds of plants. His service is typical of Warner & Swasey's long-standing policy of putting the customer *first*—of working with each customer individually to best serve his particular requirements.

YOU CAN MACHINE IT BETTER, FASTER, FOR LESS WITH WARNER & SWASEY TURRET LATHES, AUTOMATICS AND TAPPING MACHINES

Power at your Command..

ALADDIN'S POWER
yours with a GREER ACCUMULATOR

...delivered instantly when needed!

A Greer Hydraulic Accumulator is the modern counterpart of Aladdin's Lamp. With the flick of a switch you can release a hundred horsepower intermittent hydraulic thrust stored within the accumulator by a fractional horsepower motor. New Greer Bulletin 301 gives detailed information and circuits showing how Greer Hydraulic Accumulators multiply power, absorb line shocks, operate secondary circuits, maintain system pressure, and reduce the size, cost, and complexity of power-driven equipment. Send for your copy today

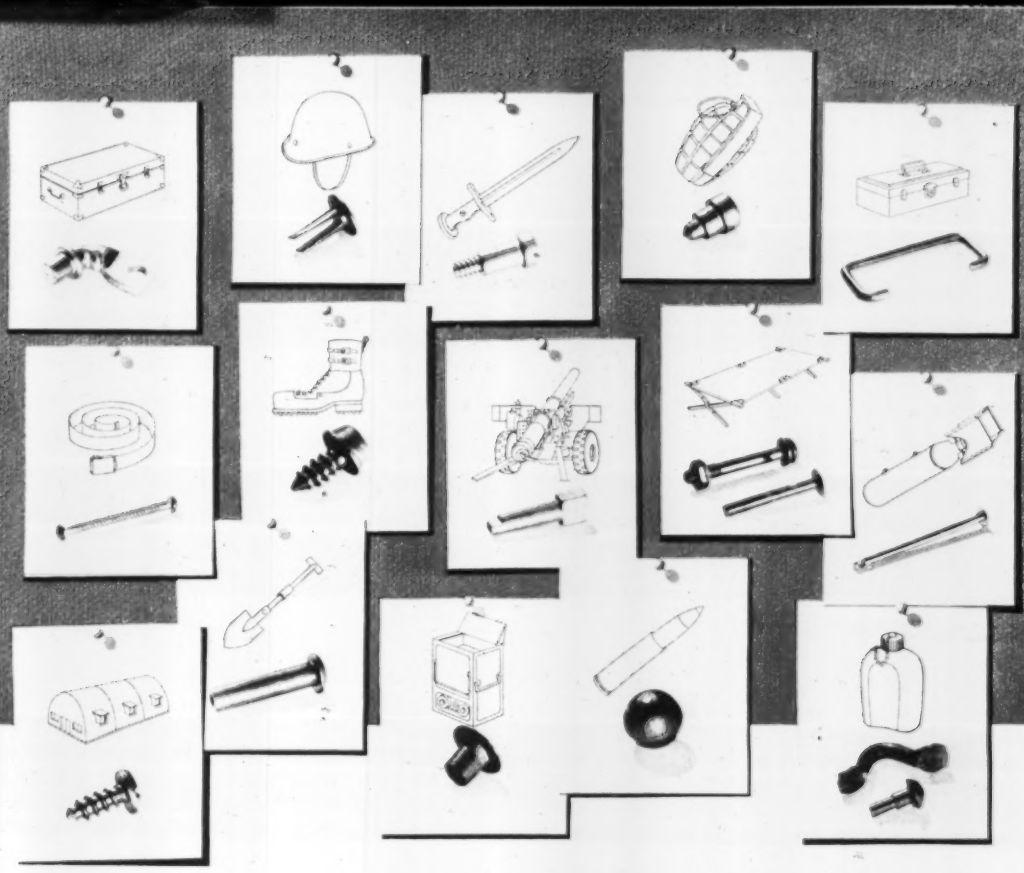
GREER ACCUMULATORS

U. S. PATENTS UNDER CLEAR LICENSES

GREER HYDRAULICS INC. • 450 EIGHTEENTH STREET • BROOKLYN 15, NEW YORK

Sales Representatives in All Principal Cities • District Office: 407 South Dearborn Street, Chicago 5

Manufacturers of HYDRAULIC ACCUMULATORS ● HIGH PRESSURE HYDRAULIC COMPONENTS ● AIRCRAFT TEST EQUIPMENT



With Townsend Fasteners and Parts you produce defense items with economy and speed

You reduce costs and speed delivery of military items by calling upon Townsend's past experience in producing special fasteners and parts for all types of Army and Navy material.

Townsend has made parts for a multitude of items from rivets for cots and beds to balls for artillery canisters — from hob nails for field boots to rivets for half track treads — from sheet metal screws for Quonset huts to pins and burrs for pup-tent poles— from special nails for gliders to large rivets for tanks— from handles for tool chests to screws for bayonets —to name but a few.

As specialists in cold heading, Townsend has demonstrated to customers everywhere the economy of parts made by the cold-heading process. It is fast, accurate and ideally suited to volume production. It also conserves metal because in this process the metal flows into shape—there are no waste shavings and chips.

As a result, Townsend produces small parts and fasteners at costs far below screw machine prices— and makes them faster. This saving in time and money may give you an advantage in bidding on government contracts. To learn more about the economy of using Townsend products, write or phone today.

Townsend

COMPANY · ESTABLISHED 1816

Plants—New Brighton, Pa. · Chicago 38, Ill.

Cherry Rivet Company Division, Los Angeles, California

Sales Offices in Principal Cities

Fixture manufacturer reports: REPUBLIC ELECTRO PAINTLOK allows "Storage Without Worry"

HERE IS HOW one manufacturer takes advantage of Republic Electro Paintlok . . . the zinc-coated, chemically-treated sheet steel that *takes* and *holds* paints, lacquers and synthetic enamels.

He finds that, in his experience, the tight zinc coating—which does not flake, crack or peel during normal fabrication—effectively resists rust when stored under controlled conditions. So . . . he uses Electro Paintlok to make big-volume runs of fluorescent fixture blanks—as many as four to five times his usual needs.

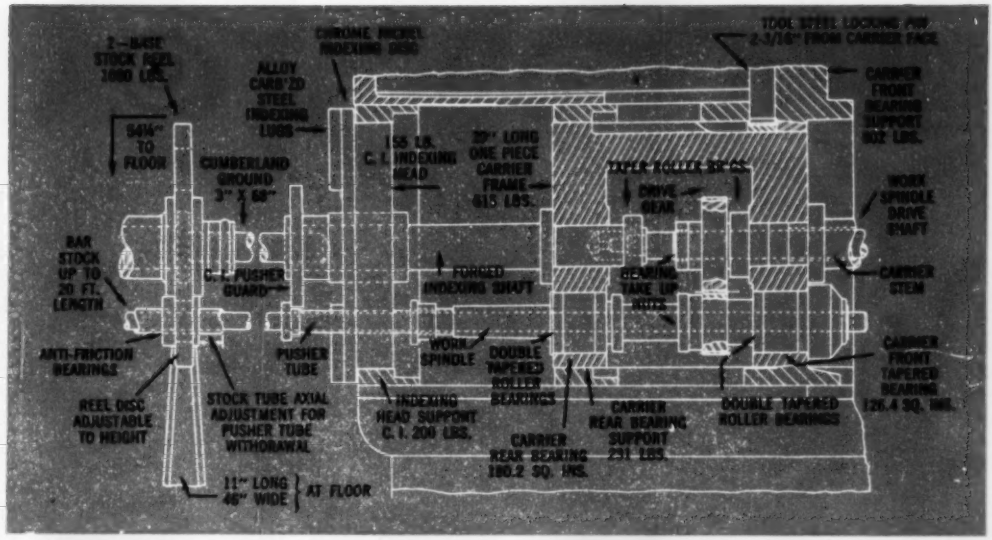
This saves him between 200% and 300% in die set-up time alone. And, storing the blanks unpainted allows him to paint them only as needed to fill orders . . . eliminating accidental damage to painted surfaces, eliminating cleaning before shipping. He estimates this saves 5% to 7% in total production costs. Finally, because Electro Paintlok takes paint so easily and smoothly, there is no reject problem.

If you make any painted steel product, you'll find booklet 525 mighty interesting. It colorfully illustrates the full Electro Paintlok story. Write for your free copy.

REPUBLIC STEEL CORPORATION
GENERAL OFFICES • CLEVELAND 1, OHIO
Export Department: Chrysler Building, New York 17, N.Y.

Republic
REPUBLIC STEEL
ELECTRO ZINC PLATED SHEETS
Electro Paintlok · Electro Zincbond

Other Republic Products include Carbon, Alloy and Stainless Steels—Sheets, Strip, Plates, Bars, Pipe, Tubing, Bolts and Nuts, Wire


2—BAR STOCK REEL 1000 LBS.
CHROME NICKEL INDEXING DISC
TOOL STEEL LOCKING PIN 2-3/16" FROM CARRIER FACE
ALLOY CARB'ZD STEEL INDEXING LUGS
CARRIER FRONT BEARING SUPPORT 502 LBS.
84¼" TO FLOOR
CUMBERLAND GROUND 3" X 68"
155 LB. C. I. INDEXING HEAD
29" LONG ONE PIECE CARRIER FRAME 615 LBS.
TAPER ROLLER BEARINGS
DRIVE GEAR
WORK SPINDLE DRIVE SHAFT
BAR STOCK UP TO 20 FT. LENGTH
C. I. PUSHER GUARD
FORGED INDEXING SHAFT
GEARING TAKE UP NUTS
CARRIER STEM
ANTI-FRICTION BEARINGS
PUSHER TUBE
WORK SPINDLE
DOUBLE TAPERED ROLLER BEARINGS
CARRIER FRONT TAPERED BEARING 126.4 SQ. INS.
REEL DISC ADJUSTABLE TO HEIGHT
STOCK TUBE AXIAL ADJUSTMENT FOR PUSHER TUBE WITHDRAWAL
INDEXING HEAD SUPPORT C. I. 200 LBS.
CARRIER REAR BEARING 180.2 SQ. INS.
CARRIER REAR BEARING SUPPORT 231 LBS.
DOUBLE TAPERED ROLLER BEARINGS
11" LONG 46" WIDE AT FLOOR

FIRST THINGS COME FIRST

Upon the Spindle Carrier of an "Automatic" falls the responsibility of accurately presenting and holding the work to — and in contact with — the tools. The basic design of the Carrier is obviously of first importance in the protection of the work spindles from the strain of heavy cuts and weight of the bar stock. Then, in proportion to the Carrier's ability to handle the full load is the importance of any supplementary facility that shares the load.

1. **The 1½" Six Spindle CONOMATIC CARRIER gives better support to the work spindles under heavy loads.**

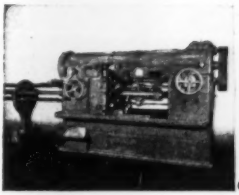
The thick, heavy ribs resist strain. The tapered front bearing and the spindle drive gears are within 3" and 9¼", respectively, of the collet faces. The wider spaced bearings give better alignment and load distribution. The Carrier is free of Cross Slide positive stop pressure.

2. **The entire INDEXING MECHANISM is supported by the Top Bed as well as the Base. There are fewer wearing parts.**

The Indexing Head takes the brunt of the indexing load. It is supported by the short frame member midway between the Carrier and the Stock Reel. It is joined to the latter by strong center shafts.

3. **The STOCK REEL is designed to handle longer and heavier loads.**

The two Stock Reel Bases are independent of the machine and relieve it of the heaviest part of the bar load during the cutting and indexing movements. Adjustable alignment gives freer stock-feed action.



Buyer's Comparison Chart will guide you to full information

A Comparison of ALL Automatics is in Favor of Cone

Conomatic

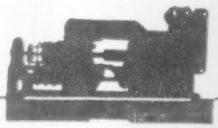
CONE AUTOMATIC MACHINE COMPANY, INC.
WINDSOR, VT., U.S.A.

SAVE ON TOOLING UP FOR THESE JOBS

You can save time and money—on munitions jobs by following the standardized procedures worked out months ago by our staff engineers.

All the necessary preliminary steps for automatic production have been thought out—and *proved* out—in advance. We can give you the standardized tooling recommendations, the times, the tolerances and the methods for almost any standard rearmament part you're planning to make.

With this ready-made experience, your present Acme-Gridley Bar Automatics are ready to swing into action at once—*profitably*. No need for educational orders, trial setups or experimental tooling. Just tell a National Acme engineer what you need. He'll recommend the rest, including the latest developments to give you top performance from your present Acme-Gridley Multiple Spindle Bar Automatics.



ACME-GRIDLEY BAR and CHUCKING AUTOMATICS built in 1, 4, 6 and 8 spindle styles, maintain accuracy at the highest spindle speeds and fastest feeds modern cutting tools can withstand.

THE NATIONAL ACME COMPANY

170 EAST 131st STREET • CLEVELAND 8, OHIO

LEWIS

Rolling Mill Equipment ... meets rolling requirements

MANUFACTURERS OF
ROLLS AND ROLLING MILL EQUIPMENT
FOR THE IRON, STEEL AND
NON-FERROUS
INDUSTRIES

LEWIS FOUNDRY AND MACHINE DIVISION OF BLAW-KNOX COMPANY • PITTSBURGH, PA.

Courtesy Kaiser Steel Corporation

Production-Records SMASHED With Open Hearths by LOFTUS

Open Hearth operators at No. 7 Furnace of the Kaiser Steel Corporation plant established a new shop record by turning out over 18,000 tons of ingot steel in the month of May.

All of the eight 200-ton Basic Open Hearths erected by Loftus are averaging 23 plus net tons per operating hour and giving

LOWER FUEL CONSUMPTION
MORE TONS PER HOUR
MORE TONS PER MONTH

Loftus-designed and constructed Open Hearths assure Lower Fuel Consumption, and greater production. That's why we say "Loftus Builds 'Em Better."

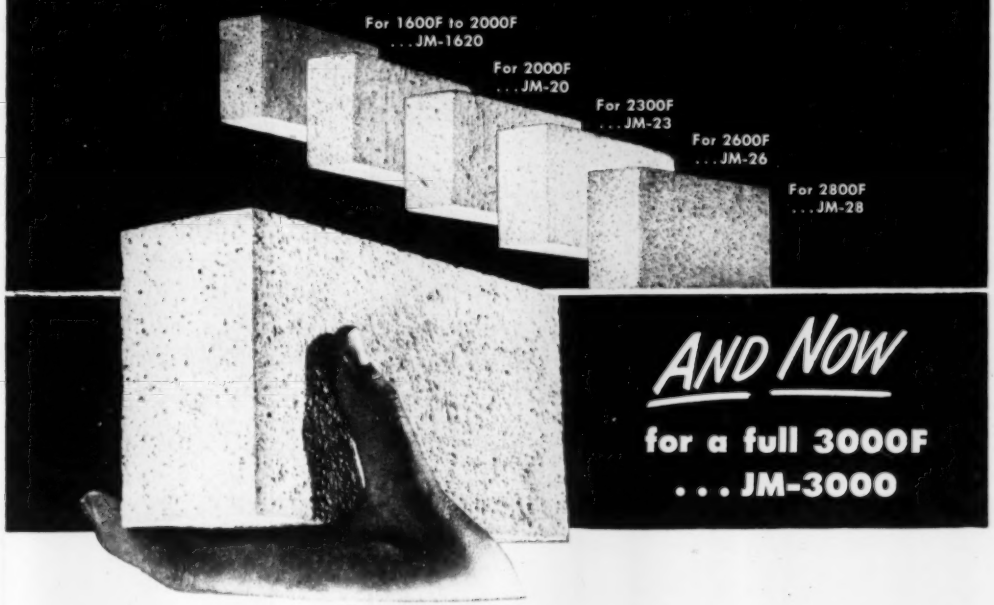
Turn Your Scrap In—Help Turn More Steel Out

LOFTUS ENGINEERING Corporation

610 SMITHFIELD ST. PITTSBURGH, PA.

Designers and Builders of INDUSTRIAL FURNACES

MEET the family of Johns-Manville Insulating Fire Brick . .



HERE IS AN OUTSTANDING FAMILY of insulating fire brick for back-up or exposed use . . . the only family of its kind . . . that gives you a complete range . . . a *quick heating* insulating fire brick for every purpose.

By taking advantage of the quick heating characteristics of these insulating fire brick, you'll benefit through important savings in fuel because of the quicker rise to proper operating temperature in the furnace. This is a result of the low heat storage capacity and low thermal conductivity characteristics of the brick. These factors are especially important where furnaces are being intermittently operated.

The same materials can also be obtained in large size units as Johns-Manville Insulating Fireblok. This product has many advantages over the smaller size fire brick, from both a construction and stability standpoint. They can be quickly applied because they are easy to cut and fit. J-M Insulating Fireblok provide additional heat savings because they reduce the number of joints, and require less mortar for bonding.

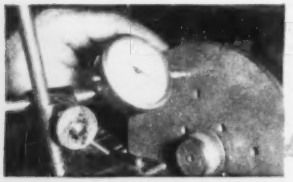
Why not have a Johns-Manville insulation expert call to tell you more about ways in which you can save by using these insulations in your furnaces. Write Johns-Manville, Box 290, New York 16, N. Y. for further information.

	JM-1620	JM-20	JM-23	JM-26	JM-28	JM-3000
Densities, lb per cu ft	29	35	42	48	58	63-67
Transverse Strengths, psi	60	80	120	125	120	200
Cold Crushing Strengths, psi	70	115	170	190	150	400
Linear Shrinkage,† percent	0.0 at 2000 F	0.0 at 2000 F	0.3 at 2300 F	1.0 at 2600 F	4.0 at 2800 F	0.8 at 3000 F
Reversible Thermal Expansion, percent	0.5–0.6 at 2000 F	0.5–0.6 at 2000 F	0.5–0.6 at 2000 F	0.5–0.6 at 2000 F	0.5–0.6 at 2000 F	0.5–0.6 at 2000 F
Conductivity* at Mean Temperatures						
500 F	0.77	0.97	1.51	1.92	2.00	3.10
1000 F	1.02	1.22	1.91	2.22	2.50	3.20
1500 F	1.27	1.47	2.31	2.52	3.00	3.35
2000 F	—	1.72	2.70	2.82	3.50	3.60
Recommended Service						
Back up	2000 F	2000 F	2300 F	2600 F	2800 F	3000 F
Exposed	1600 F	2000 F	2300 F	2600 F	2800 F	3000 F

† 24-hr simulative service panel test for JM-3000, 24-hr soaking period for other brick. * Conductivity is expressed in Btu in. per sq ft per F per hour at the designated mean temperatures. Note: Above tests are in accordance with A.S.T.M. tentative standards.

JOHNS-MANVILLE JM PRODUCTS

Johns-Manville First in INSULATIONS



Be sure spindle and back plate run true.

Mount on adapter to facilitate changing wheels.

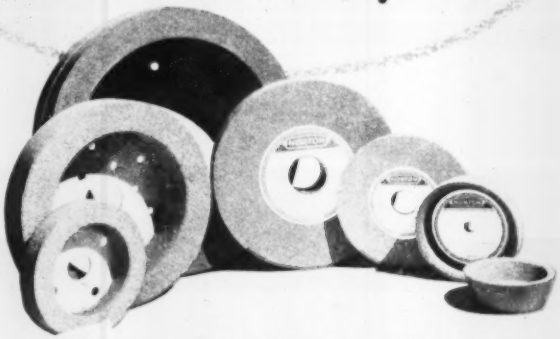
Maintain correct wheel speeds for bond types.

Grind wet whenever possible.

Dress wheels only when necessary.

Use Norton training films on carbide grinding and diamond wheel operation.

Tips on Diamond Wheel Operation THAT WILL Lengthen Wheel Life and Cut Carbide Grinding Costs



AND ...Investigate The New K-Bond Crystolon* Wheels

These faster, freer cutting silicon carbide wheels give you greatly increased uniformity of grinding action. This new vitrified bond is so accurately controllable that half-grade increments of hardness are possible — enabling you to "pin-point" specifications to your individual needs. In many cases Norton K-Bond CRYSTOLON wheels permit saving your more expensive diamond wheels for finishing, since they take care of numerous rough grinding jobs with entire satisfaction.

Your Norton Distributor

is your contact point for a vast store of knowledge covering every detail of abrasives and grinding — available through Norton Abrasive Engineers in every industrial center, and through the Norton specialists in Worcester. See your Norton Distributor for the *right* wheels to use in your carbide grinding applications, and ask him for this free 140-page booklet on carbide grinding. Or write direct for FORM 167. NORTON COMPANY, Worcester 6, Mass. Distributors in all principal cities.

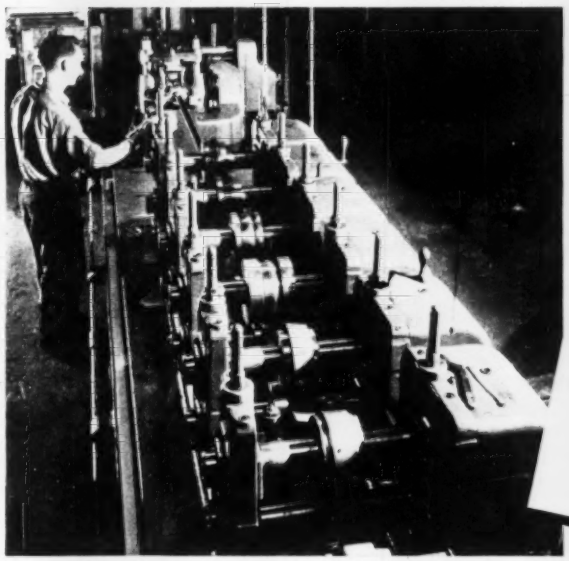
*Trade-Mark Reg. U. S. Pat. Off. and Foreign Countries

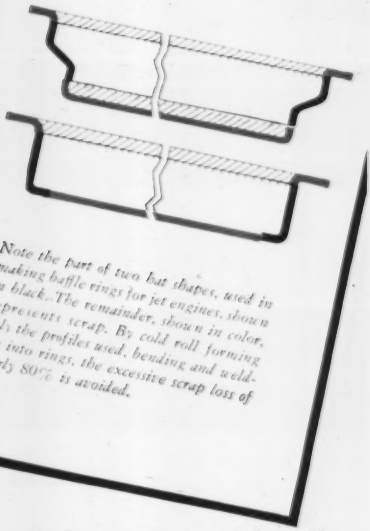
NORTON ABRASIVES

Making better products to make other products better

12 EXAMPLES OF ECONOMIES

effected by combining different operations in a YODER Roll Forming Machine





Note the part of two hat shapes, used in making baffle rings for jet engines, shown in black. The remainder, shown in color, represents scrap. By cold roll forming only the profiles used, bending and welding into rings, the excessive scrap loss of nearly 80% is avoided.

No. 12. Up to 80% saving in material cost by cold-roll forming, avoiding former heavy scrap loss

Of all the methods available for cold-shaping flat rolled metal, the cold roll forming machine offers the highest production per man hour and the lowest conversion cost. It is often a good investment even when operated only a few days per month.

Of still greater importance than conversion cost is often the saving of weight which may be effected by designing light, strong box, tubular and other special structurals to take the place of hot rolled angles, channels, tees, etc. Material savings up to 50% are frequently made.

In press forming of hat shapes to make stator rings for jet engines, up to 80% of the metal has to be cut away and discarded in order to obtain one ring. By cold roll forming the profile from strip, cutting to length, bending into rings and joining ends by welding, this huge scrap loss is avoided. Here is another example of how a Yoder cold Roll Forming production line may save scarce and expensive stainless steel, aluminum, brass and other metals. In such cases, the material savings alone may be many times greater than the conversion cost, even for relatively small quantities.

Function, scope, and economics as well as mechanics of cold roll forming, are discussed in Yoder's 86-page illustrated book which will be sent on request. Recommendations and estimates for the asking.

THE YODER COMPANY • 5502 Walworth Avenue, Cleveland 2, Ohio, U. S. A.

Complete Production Lines

- ★ COLD-ROLL-FORMING and auxiliary machinery
- ★ GANG SLITTING LINES for Coils and Sheets
- ★ PIPE and TUBE MILLS–cold forming and welding

ENGINEERING YODER MANUFACTURING

Constructed to Take Severe Punishment

Without Tube Swelling

Tube Securely Locked by Special Stainless Steel Inner Wire Braid!

Illustration above shows how exclusive inner stainless steel braid of CONCORD #20 Steam Hose prevents tube swelling and assures long life under severe use.

CONCORD #20 STEAM HOSE

Here's the steam hose with a structural difference that eliminates . . . once and for all . . . the common failure of tube swelling under continuous high pressure operation.

CONCORD #20 Steam Hose gives you the exclusive protection of a tough inner lining . . . a lining of stainless steel wire braid. This braid assures permanent retention of the original inside hose diameter. It prevents swelling and constriction of the tube . . . assures full flow of steam at all times . . . permits re-coupling in the field when necessary, without the slightest difficulty.

In addition, CONCORD #20 construction features include: two or three braids (depending on size) of alternate high tensile steel wire and rubber layers are firmly bonded over the outside of the tube. They provide maximum burst-protection and safety. An asbestos braid provides positive cover adhesion and serves as cover insulator. On top of all is the rugged, abrasion-resistant cover that withstands the severest abuse.

Flexible, tough and dependable . . . that's BWH's new CONCORD #20! Ask your nearby BWH distributor for a demonstration. Get in touch with him today, or write us direct.

Another Quality Product of

BOSTON WOVEN HOSE & RUBBER COMPANY

Distributors in all Principal Cities

PLANT: CAMBRIDGE, MASS. • P. O. BOX 1071, BOSTON 3, MASS., U. S. A.

BWH DEPENDABLE RUGGEDNESS

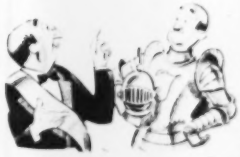
lubricates these dies, Plunkett!"

Stretch die life. Conserve critical tool steels. Eliminate difficult cleaning operations on finished parts. Switch to *pre-coated* THOMAS STRIP for stamped, drawn and formed parts. Most Thomas coatings lubricate dies... stretch die life... give more production per grind. They help eliminate cleaning, plating, polishing operations... and give fabricated parts a uniform finish inside and out. Write today for test samples and specific recommendations.

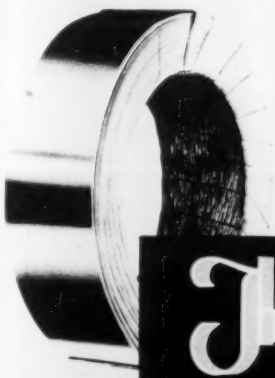
THE THOMAS STEEL COMPANY • Warren, Ohio

Pre-Coated THOMASSTRIP adds color to your product without costing you one red cent for new equipment . . . saves plenty in fact, by eliminating processing steps. And, the snap and sparkle of gleaming coatings quickly change lack-lustre products into brisk best-sellers.

Rust-resistant, corrosion-resistant Thomas coatings allow economical big-volume runs of stampings and formed parts . . . and economical finishing. Make storage easier . . . keep product quality up.



Cold rolled steel base of pre-coated THOMAS STRIP is manufactured to your specifications . . . fits your fabricating equipment to a "T". Special finishes are tailored to all fabricating and functional needs of your product.



COLD ROLLED STRIP STEEL

Electrolytically pre-coated with Zinc, Copper, Brass, Nickel and Chromium. • In Natural, Planished and Buffed Finishes • Hot Dip Tin and Lead Alloy Coated • Lacquer Coated in Colors • Annealed Spring Steel • Alloy Strip Steel • Uncoated Strip Steel • Carefully produced to your specifications

Thomas Strip

SPEEDS PRODUCTION . . . CUTS COSTS

THEIR "EP" LASTS...

so TEXACO MEROPA LUBRICANTS give reduction gears longer lasting protection

It's been proved in mills everywhere! *In actual service*, the EP (Extreme Pressure) properties of *Texaco Meropa Lubricants* stand up better than other reduction gear lubricants. Even after months of hard service, EP characteristics are maintained. No wonder gears last longer, maintenance costs come down!

Texaco Meropa Lubricants also rate tops for resistance to oxidation and thickening. They do not foam, do not separate in service, storage or centrifuging. And you can count on them to protect bearings from corrosion.

For long-lasting protection of oil film roll necks, use *Texaco Regal Oils*. They're turbine-grade oils especially designed for heavy duty service — with extra-high resistance to oxidation, emulsification and sludging.

For cost-reducing lubrication throughout your mill, call in a Texaco Lubrication Engineer. Just contact the nearest of the more than 2,000 Texaco Distributing Plants in the 48 States, or write The Texas Company, 135 East 42nd Street, New York 17, N. Y.

TEXACO

TEXACO Meropa Lubricants

FOR STEEL MILL GEAR DRIVES

The Metalworking Outlook

August 13, 1951

Repercussions in Steel

More than 100 machine tool builders who tried to place advance steel allotments for the fourth quarter all had their orders turned down by mills or warehouses. The development, another that shows CMP steel distribution in the fourth quarter will not be smooth (p. 45), is bound to have repercussions. One may be that NPA will establish a special priority identification system—a sort of CMP within a CMP—to make sure that essential equipment builders are taken care of first. Other people who might get such special treatment are makers of heat treating apparatus.

New System for Tightest Materials?

NPA may use the special identification system on some of the tightest products, too. The agency might single out some of the materials hardest to get—heavy steel castings could be one—and put rigid controls on them which would mean that the government would give special screening on where practically every ton goes. NPA would have to be desperate to go to such lengths, but in some cases it is just about at that stage now.

CMP Will Stay

Despite announcement that CMP will become a closed-end plan by Oct. 1, despite the preliminary work CMP personnel are doing on allotments for the first quarter, 1952, rumors persist that the whole program will soon be scrapped. People connected with CMP from Manly Fleischmann on down all deny the rumors. "The plan hasn't yet had a chance; give it time," they say.

Out on a Limb

Surprisingly, some consumers of CMP materials have not yet put in their applications for fourth-quarter allocations even though the final deadline was supposed to have been July 31. Consumer goods manufacturers are the worst offenders. If you haven't filed for fourth quarter, do so at once. You're probably too late to get a very good deal, but you may get something. Those who are eligible to file but haven't and don't, soon will find themselves far, far out on a limb.

Tempest Subsides

The flip-flops that NLRB has done in the past month or so on filing of non-Communist affidavits have stirred a tempest in a teapot. NLRB first made a decision—in the case of Ford and a Canton, O., UAW local—that a union shop clause was not lawful because CIO national officers had not filed affidavits when the agreement was made, even though UAW officers had. Theoretically that would have permitted other unions legally to seek to represent the CIO workers. Storms of protest arose about the decision both from labor and industry. Practically, the CIO was not seriously threatened, except in a few isolated cases, because it's in solid with the workers who in a re-election probably

Production Engineering News—p. 73 *The Market Outlook—p. 139*

would have voted for it anyway, affidavit or no affidavit. NLRB finally calmed things down when it reversed its earlier decision.

Some Good Points

Labor leaders have officially blasted the new Defense Production Act of 1951 as "weak" and "emasculated," but privately some of them are delighted with it, or at least with President Truman's comments on it. They will nurture his remarks about the measure's pricing provisions "forcing" higher wages and use them in demands coming up this fall. A few weeks ago labor had been at least partly convinced that it would have to concentrate on fringe benefits in its demands in coming months, but now it may come out more forthrightly for cash pay boosts.

Canada Licks Inflation

Keep your eye on how Canada makes out with inflation controls. Rigid curbs in the dominion—many of them far stiffer than we have in the U.S.—have thus far kept inflation better checked there than here. If U.S. inflation gets out of hand, it won't be surprising if we get some curbs similar to those fashioned to the north, Defense Production Act of 1951 or not. Canada has managed through tight restrictions on consumer credit, high commodity taxes and credit restrictions on new loans to manufacturers and merchants who have been borrowing money to increase inventories.

Time for Decision

If you have a plant expansion project that you still haven't finally decided upon, make up your mind soon. The tighter curbs on big expansion projects that NPA has come out with presage more and more restrictions to come on all but specialized construction. What's more, criticism is not dying down about the government's policy of permitting expansion costs to be written off in five years for tax purposes. If you wait too long to decide on your program, it's conceivable that you'll also lose those tax benefits.

Straws in the Wind

Employment in the U. S. hit 62,526,000 in the week ended July 14, highest July mark on record . . . NPA told locomotive builders their production will be reduced about 10 per cent in the first quarter next year because of smaller allocations of steel, copper and aluminum . . . Common stockholders of Thomas Steel Co. have approved the proposed merger with Pittsburgh Steel Co . . .The Army plans to build a $32 million gun barrel plant near Point Pleasant, W. Va., site of the West Virginia Ordnance Works.

What Industry Is Doing

Convair is building a new swept-wing jet version of the B-36 heavy bomber. It'll be called the YB-60 (p. 50) . . . Titanium Metals Corp. of America is putting up an integrated titanium plant in Henderson, Nev., that will boost world production eight-fold (p.48). . . Sweeping changes in body lines might be seen in Ford's '52 models (p. 59) . . . A million-dollar plant to produce ferromanganese and other alloys will be built in Houston by newly-formed Tenn-Tex Alloy & Chemical Corp. (p. 49) . . . July freight car output was slashed in half after nearing its 10,000-car-a-month goal in June (p. 63).

the MAGIC GENIE

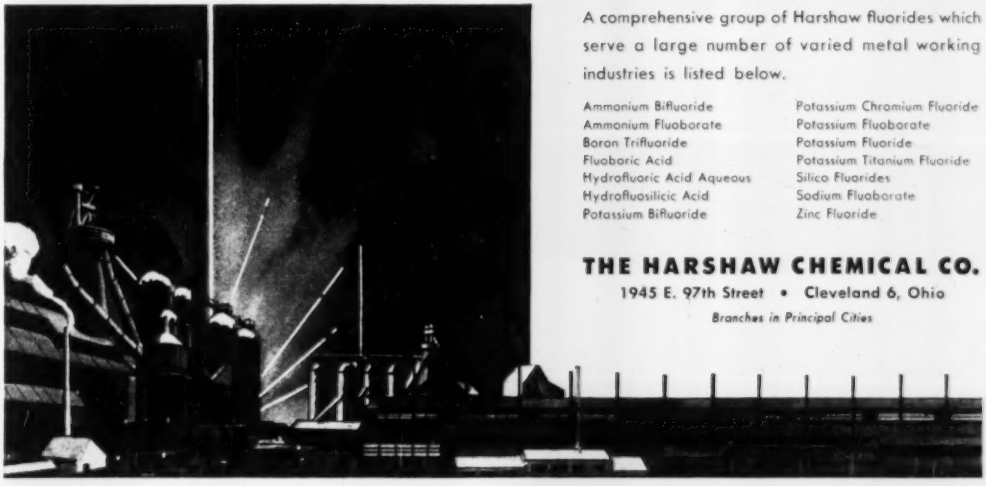
of the metal industry

HARSHAW FLUORIDES

● Like the magic genie of old, Harshaw Fluorides work capably and efficiently for the metal industry. They are used in many operations . . . fluxing, galvanizing, pickling, enameling, surface coating, electro plating, heat treating, smelting, and as synthetic optical crystals in testing devices, and in many other ways.

A comprehensive group of Harshaw fluorides which serve a large number of varied metal working industries is listed below.

Ammonium Bifluoride
Ammonium Fluoborate
Boron Trifluoride
Fluoboric Acid
Hydrofluoric Acid Aqueous
Hydrofluosilicic Acid
Potassium Bifluoride
Potassium Chromium Fluoride
Potassium Fluoborate
Potassium Fluoride
Potassium Titanium Fluoride
Silico Fluorides
Sodium Fluoborate
Zinc Fluoride



THE HARSHAW CHEMICAL CO.

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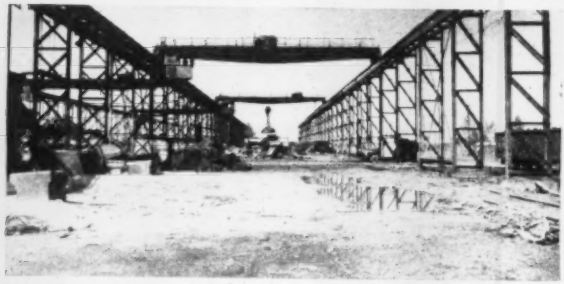
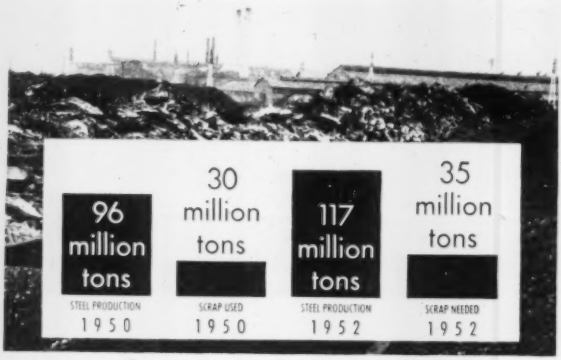
LET'S FACE THESE FACTS ABOUT SCRAP | THEN ACT!

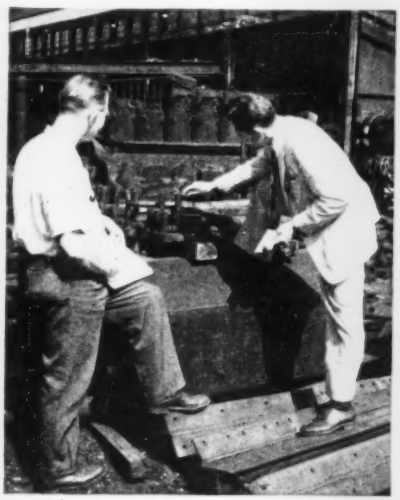


This is no "scare" campaign for more iron and steel scrap. But it boils down to a few simple facts: **1.** Scrap inventories are dangerously low in steel mills all over the country. **2.** More steel scrap is needed today than ever before because steel-making capacity is greater.



Present low scrap piles in steel mills are due to one thing—the growth of steel production to more than 100 million tons a year, which requires several million more tons of scrap than have ever been available. By the end of 1952 steel production will hit 117 million tons a year. Besides scrap available from steel-making operations, the industry will require 5 million more tons of scrap than were needed in 1950.

Only top-management action can help insure an adequate supply of scrap. Many industrial leaders have named a permanent "salvage committee" for their plants and yards. This committee reports on all worn-out equipment and management decides what should be sold.



Remember, scrap resulting from current production isn't enough. Your committee should check every questionable piece of equipment and list all obsolete dies, jigs, equipment and machines. Then call your scrap dealer.

ARMCO STEEL CORPORATION

4071 CURTIS STREET, MIDDLETOWN, OHIO • PLANTS AND SALES OFFICES FROM COAST TO COAST • EXPORT: THE ARMCO INTERNATIONAL CORPORATION

ARMCO STEEL

The Greater Threat

Two major problems facing Congress are determining how much the nation will spend on certain objectives and enacting a tax law that will provide the required revenue equitably. To date, proposals put forth by the administration on both problems are asinine beyond belief.

As to expenditures, administration spokesmen from President Truman down take fiendish delight in telling us we will have to spend more than was thought necessary a week, a month or a year ago. They will not admit with any degree of enthusiasm that there is merit in economy. They insist there is no way to reduce expenditures.

Mr. Truman says that $8.5 billion must be spent in the current fiscal year on foreign aid. Wherever you live, figure your state's share of this sum. You will find it exceeds what your state spends annually for running the state government. Break it down for your county's share and you will find Mr. Truman is asking your county to spend more for foreign aid than it is spending for schools for your children.

Admitting that foreign aid is a good investment up to a certain point, can we afford the amount asked? Has the administration weighed foreign aid in relation to other needs? The answer is that Washington has lost all sense of proportion.

Where will the tax money come from? The House version of the tax law—presumably sponsored by CIO and socialistic-minded Trumanites—proposes to take the lion's share from corporations and individuals in the upper income brackets. Simple arithmetic will show that the fantastic sums demanded by Mr. Truman can be satisfied only by confiscating almost total income from upper-bracket individuals, taxing middle class persons exorbitantly and levying violently upon low incomes. Another year or two of extortion from the rich will place the major burden of taxes upon the lower income groups.

The administration's policies of reckless spending and discriminatory taxes at exorbitant levels constitute a more imminent threat to the nation's security than the ambitions of the Kremlin. We should insist that Congress act to remove this threat now—before it is too late.

E. C. Shaner

EDITOR-IN-CHIEF

REPEAT OLD MISTAKE: At their quarterly meeting in Buffalo, trustees of the National Tool & Die Manufacturers Association surveyed problems in connection with the defense program and concluded that their major difficulty is a pronounced shortage of skilled workers. Herbert S. Jahn, association president, reported that tool and die shops in the Chicago

area could use 500 more skilled workers, the Cleveland area 400, Dayton 300, Indianapolis 200, Rochester 200 to 250 and western Massachusetts several hundred more.

In some of these areas, tool and die shops are unable to train new workers because of draft deferment policies. Some local draft boards seem to be unable to recognize the vital role of tool and die work in defense. This sounds very much like the failure of Washington officials to recognize the key position of machine tools until recently. Apparently the bureaucratic mind cannot conceive that a small industry can be important. —p. 48

SCRAP FROM FAR EAST: Two separate missions are checking on the possibilities of recovering war scrap in the Far East. A seven-man committee representing Japanese steel producers is in Saigon, Indo-China, looking into the salvage of steel from Japanese vessels sunk during World War II. It is estimated that 86 ships were sunk along the Indo-Chinese coast and in nearby rivers and that as much as 350,000 tons of scrap could be recovered. Salvage operations would be undertaken by private interests if governmental approval is granted.

Three representatives of American steel companies are heading for Korea, under government sponsorship, to investigate the economic feasibility of collecting and shipping battlefield scrap to the United States. Some estimates place the volume of scrap resulting from fighting during the past 13 months at around 200,000 tons.

Earlier efforts to return war scrap from Pacific points proved disappointing. The present acute need for the material calls for a more determined drive this time. —p. 47

LOCK MAKERS CONVERT: Lock manufacturers find it easy to get into defense work in either of two ways or both. Many of the 75 to 100 companies in the industry in the United States find that from 20 to 25 per cent of their lock production is going to the military. Some of the larger companies, whose diverse "know how" and equipment enable them to get defense contracts for buckles, hand grenades, shells, rockets and fuses, find their facilities are engaged almost 100 per cent on war work.

Normally, the industry turns out about 100 million locks a year. There are two major classifications. One is building hardware, consisting of lock sets and night latches. The other is cabinet locks, comprising those used for automobiles, tool boxes, lockers, desks, parking meters, office equipment and vending machines. Since 1945 gratifying progress in standardization has cut down the number of varieties of locks. This is saving materials and equipment and is a godsend to the industry's defense effort. —p. 48

PROGRESSIVE INDUSTRY: Of the numerous characteristics which make the American gear manufacturing industry distinctive, there are two which are seldom emphasized. One is the wide distribution of gear-making establishments geographically. The other is the constant change in materials from which gears are made.

About 400 companies—more or less—make gears. A majority of them operate on a job-shop basis; most of the others operate under "captive" conditions. Regardless of method of operation, gear shops are scattered widely and every state in the union has at least one company prepared to make gears on order.

Gears are made of wood, aluminum, bronze, iron, steel, rawhide, Bakelite, fabric and nylon, plus a widening number of materials now gaining acceptance such as titanium, powdered metals and plastics. It is a dynamic, enterprising industry. —p. 56

IRONING OUT THE BUGS: In the final installment of a series of articles on the cold rolling of strip steel, Author J. D. Keller digresses from his general text to deal briefly with the problems of end thrust and spalling of rolls. In reading his discussion of these difficulties, one does not have to be a technical expert to realize that end thrust and spalling are somewhat extreme examples of many "bugs" which had to be eliminated from the rolling of strip in the relatively short time we have had experience with continuous mills.

Of course end thrust and spalling still are problems which have to be considered, but some of the old causes have been placed under control. When one thinks of what has been done to develop strip rolling to its present state of effectiveness, one has to give great credit to the men who iron out the "bugs." —p. 88

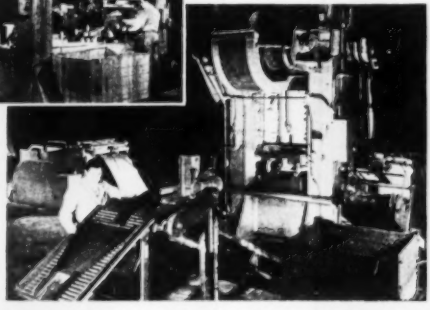
Firestone STEEL PRODUCTS SPEEDS DEFENSE SUB-CONTRACTS WITH NEW PRODUCTION LINES

Automatic Machines and Integrated Production Turn Out Large-Size Stampings in Record Time

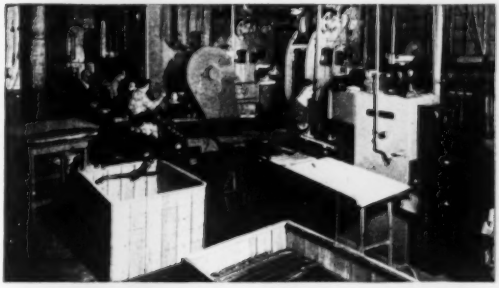
NEW automatic stamping machines are clicking out large-size stampings in record time at Firestone Steel Products, saving valuable time and money on defense sub-contracts. All production is integrated, from blanking through to painting or polishing.

Firestone's two modernized metal fabricating plants at Akron, Ohio and Wyandotte, Michigan have been completely retooled for fast, low-cost production of those heavy, large-size stampings and assemblies so vital to the speedy delivery of aircraft and ordnance equipment and accessories. If your problem is large size stampings in a hurry, wire or phone Firestone Steel Products Company, Stampings Division, Akron 1, Ohio.

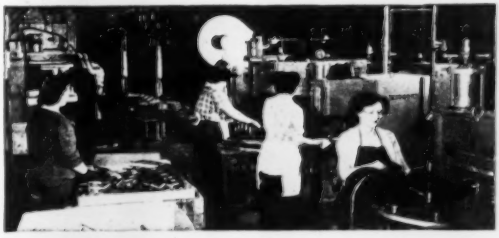
One of the huge multiple-die forming presses recently installed at Firestone for making jet engine components and parts for tanks.



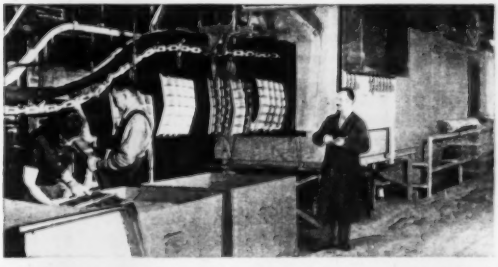
One of the new completely automatic synchronized presses producing 2600 large-size blanks per hour. Steel is fed from roll at extreme left.



Assembly operations are closely integrated with presses at Firestone, saving time and money. As many as four operations are handled at one time on new multiple-operating presses in left background.

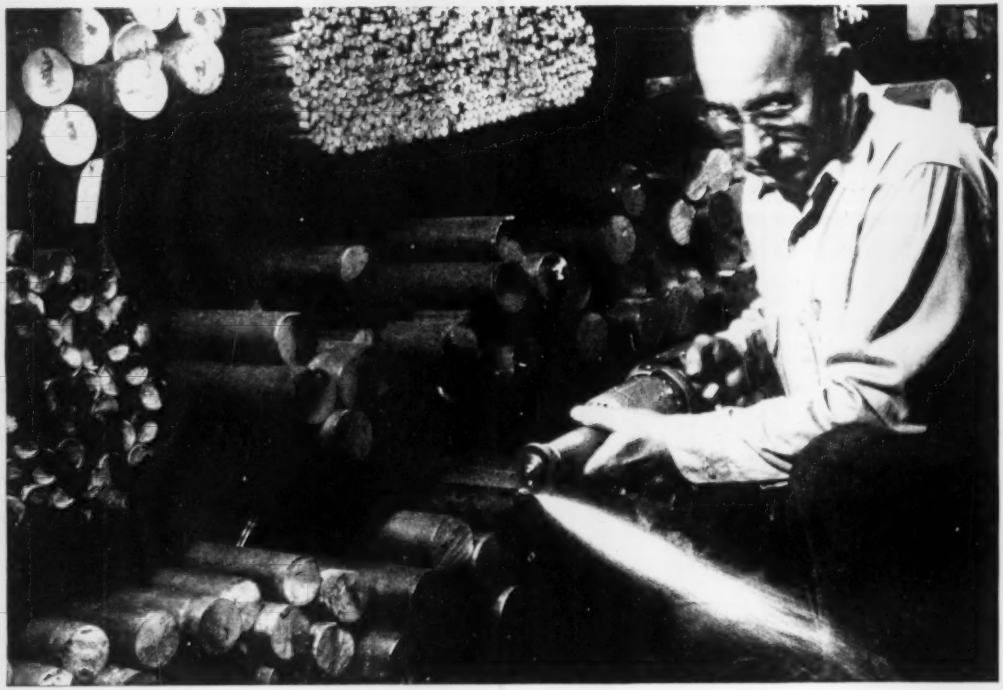


Fast, efficient, straight-line methods save time and handling at Firestone. Parts move from presses on rollers or overhead conveyors to next operation.



Washing, bonderizing, painting, and baking are handled in a continuous automatic operation, moving entirely on conveyors from the stamping line.

Copyright, 1951, The Firestone Tire & Rubber Co.



How to Take *Chance* Out of Today's Alloy Buying

Here's a spark tester checking bars of Ryerson alloy steel. By reading the spark pattern thrown off when each bar is touched with this whirling, abrasive wheel, the tester determines the steel's analysis. In this way he verifies quality—guards against mixed steels.

Spark testing is only one of many steps in the Ryerson Certified Steel Plan for safer alloy buying—a plan especially important to you today, while restrictions are enforcing the use of leaner alloys with unfamiliar heat treatment response.

We also put every heat of Ryerson alloy steel through four separate hardenability tests, carefully recording the results on a Ryerson Alloy Certificate which goes with the steel. These tests enable you to buy Ryerson alloys on the basis of hardenability as well as analysis—the safest way to buy under today's changing conditions. And the recorded test results safely guide your heat treatment.

So play safe. Order from Ryerson where you can specify hardenability and be doubly sure. Stocks are out of balance from a size standpoint, but in all probability we can take care of your requirements.

PRINCIPAL PRODUCTS

CARBON STEEL BARS—Hot rolled and cold finished

STRUCTURALS—Channels, angles, beams, etc.

PLATES—Many types including Inland 4-Way Safety Plate

SHEETS—Hot and cold rolled, many types and coatings

TUBING—Seamless and welded, mechanical and boiler tubes

ALLOYS—Hot rolled, cold finished, heat treated

STAINLESS—Allegheny bars, plates, sheets, tubes, etc.

REINFORCING—Bars and accessories, spirals, wire mesh

BABBITT—Five grades, also Ryertex plastic bearings

MACHINERY & TOOLS—For metal fabrication

RYERSON STEEL

JOSEPH T. RYERSON & SON, INC. PLANTS AT: NEW YORK • BOSTON • PHILADELPHIA • CINCINNATI • CLEVELAND
DETROIT • PITTSBURGH • BUFFALO • CHICAGO • MILWAUKEE • ST. LOUIS • LOS ANGELES • SAN FRANCISCO

Fourth Quarter Steel Tangle Likely

Despite NPA's stand that steel distribution problems would resolve naturally under CMP by the fourth quarter, the snarl in that period may be as bad as in September

STEEL distribution under the Controlled Materials Plan promises to be in as bad a tangle in the fourth quarter as it already is for September, judging from experiences thus far of steel consumers who are trying to get on mill books for the last three months of the year.

That's the situation as metalworking men see it, despite NPA's official stand that "many of the problems in steel will work themselves out naturally by the fourth quarter." (STEEL, Aug. 6, p. 43). The forecast of what will happen in the fourth quarter is based on the troubles consumers had who are authorized to place advance allotments for that period. Actual CMP tickets for the steel consumer for October, November and December won't be issued until late this week, but enough of the advance allotment orders have been turned down to show there's trouble ahead.

Fuel for the Flames—Adding to the complexity of the fourth-quarter situation will be the shift from the open-end to closed-end CMP. By Oct. 1, all users of steel, copper and aluminum will be under the program whether they produce machine tools or washing machines. In the long-run that may make CMP easier to administer, but for a while the move promises to aggravate steel distribution troubles.

Defense Production Administrator Manly Fleischmann says, "violations of the CMP regulations and not the alleged over-issuance of CMP allotments are causing the difficulties" in September. He charges that steel consumers have "placed duplicate orders with different suppliers, placed orders for delivery in a single month for more than the authorized 35 per cent of the total quarterly allotment they can receive in one month and failed to cancel or adjust outstanding orders that exceed the limitations on the use of materials set by authorized production schedules."

To Justice—Mr. Fleischmann points out that NPA is now auditing the records of about 1000 companies in a cross-section of industries to check compliance with CMP regulations. Willful violations will be referred to the department of Justice for criminal prosecution or injunctive proceedings or to an NPA Hearing Commissioner for issuance of a suspension order withdrawing CMP allotments and priority assistance.

New light on charges and countercharges about CMP coming from both industry and government may develop in hearings on the whole subject by the House Small Business Subcommittee No. 3, chairmanned by Rep. Clarence G. Burton (Dem., Va.). The hearings began late last week and will continue for several weeks yet.

CMP—FROM THREE ANGLES

Chances for Materials Relief: The Odds Are Against You

SHORT OF CMP or other critical materials? You can take your request for relief to the NPA Appeals Board, Commerce Building, Washington, but you're almost certain to be turned down unless you can show that your dilemma hurts the national defense program. The board said "no" in eight of the first nine requests from metalworking companies for more materials.

Bendix Aviation Corp., South Bend, Ind., was the only successful applicant. It won permission, until Oct. 20, 1951, to use no more than 1000 pounds of cadmium for coating airplane struts and wheels for military and commercial aircraft. In the meantime the company is to install a substitute plating process in compliance with the zinc substitution requirement of Order M-19.

Haydon Mfg. Co. Inc., Torrington, Conn., was denied additional copper under M-12 on a temporary basis for the manufacture of electric timing devices on the ground there had been "no persuasive showing of exceptional hardship." Company was advised it would have to depend on its CMP allotment.

Victor Industries Corp., Brooklyn, N. Y., requested under M-22 permission to use in excess of the quota under M-7 of aluminum tube slugs resulting from toll conversion of self-generated scrap. Denied because "no persuasive evidence of unreasonable hardship which is not suffered generally in the industry."

Western Insulated Wire Co., Los Angeles, requested more rubber under M-2 for the manufacture of insulated portable electric cables. Denied because "no evidence of exceptional hardship not suffered by others" and also because appellant since filing the appeal had received a third-quarter copper allotment insufficient to permit utilization of the amount of rubber it is presently receiving.

J. S. Turner White Metal Co., New Brunswick, N. J., requested adjustment of its base period usage of lead for manufacture of collapsible tubes. Relief denied because there was "no persuasive showing that appellant was suffering an exceptional and unreasonable hardship not suffered generally by others in the same industry."

Clemson Bros. Inc., Middletown, N. Y., asked adjustment of its base period usage of steel under M-47 for manufacture of hand-operated lawn mowers; claimed the tonnage in second quarter of 1950 was abnormally

low. Appeal denied, "no persuasive showing was made of exceptional or unreasonable hardship."

Benjamin Wolff & Co., Chicago, appealed for an allotment of ten tons of floor plate per month, claiming that during the base period its purchases had been stopped because of excessive inventories, so that the company could show no base period tonnage. Request denied.

L-Mar Inc., Newark, N. J., which went into business only one week prior to issuance of M-6, said this circumstance made it impossible to claim a base period for shipments of steel from mills to warehouse under M-6. The board denied the appeal saying there had been "no persuasive showing of unreasonable hardship not suffered by others, and no improper discrimination was shown."

Blackstone Corp., Jamestown, N. Y., asked for adjustment, under Section 7 of M-47, in its base period usage of steel for production of washing machines. Appeal was denied.

Substitute for CMP Proposed

A lot of thinking is going on these days as to whether there should be a Controlled Materials Plan, or whether, if we're going to have controls, there should be some other plan.

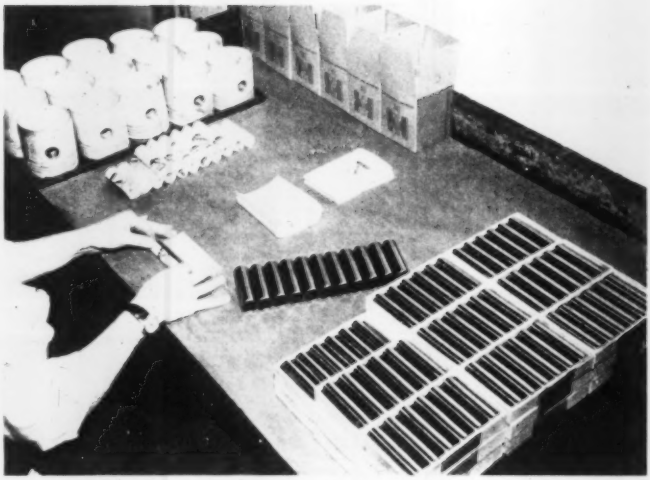
Out of this thinking comes a plan called "Time-Locked Priorities." The idea is outlined in a book authored by Arthur I. Appleton, president, Appleton Electric Co., Chicago, electrical equipment manufacturer.

Through use of priority labels designating when materials can be used, supplies would be channeled to projects as needed. Hence the name "Time-Locked;" in effect materials would be locked out of use until they were needed, so there would be no incentive to overstock materials; thus the materials supply would be adequately spread around.

Actually the control, under Mr. Appleton's plan, is not on raw materials but on the distribution of the end products. "The control of the character of the end-product demand in the proposed plan," says Mr. Appleton, "would be accomplished through basic priority ratings assigned to projects, which ratings would insure that the 'first fruits' of the industrial end-product would be limited to most essential uses, and that the remainder of the industrial end-products would be systematically distributed in the best interests of the overall wartime economy."

The "Time-Locked Priorities" plan was conceived by Mr. Appleton from his dual experiences during World War II. First he had the responsibility of applying the several priority plans, in effect at different periods, to the operation of a large and essential manufacturing enterprise. Later, as an officer in the U. S. Navy he was able to observe the actual effects of those controls as evidenced by the flow of war materiel to and through the country's largest Naval Supply Depot.

Mr. Appleton believes his plan is so simple and practical that it deserves the most serious consideration of every businessman, business organization as well as the federal government.



NO MUSS, NO FUSS: The Ft. Wayne service parts plant of International Harvester no longer dips products like these piston pins in oil and grease-type inhibitors. Instead I-H packages them in a Nox-Rust Vapor wrapper, protected by the rust-inhibiting chemical Callex, with which the paper is impregnated. The wrapper is made by Nox-Rust Chemical Corp., Chicago

Europe Lowers Boom on Steel Exports

METALWORKING companies face a further materials squeeze.

Unable to get all the domestic steel it needs, the metalworking industry has been drawing upon foreign steel supplies. Even though this foreign supply doesn't solve the materials problem it is a welcome addition. Now it appears the foreign suppliers are going to make a sharp reduction in their exports to us.

European suppliers and their governments are incensed over profits being made by importers and brokers who distribute imported steel in the U. S.

Because of dissatisfaction over selling practices and prices, one French mill already is taking steps to handle directly its sales to U. S. consumers.

What This Country Needs — In studying this situation, a National Production Authority committee sees the need for an improved method of selling and distributing foreign steel in the U. S. Heading this committee is Lewis Allen Weiss, NPA Assistant Administrator for Civilian Requirements. Mr. Weiss, former chairman of the board of the Mutual Broadcasting System, is interested especially in making more foreign steel available to the consumer durable goods industries in the U. S.

The United States is importing steel at the rate of 3 million net tons annually—but that round figure tells only part of the story. Foreign steel cannot be used for many of the products of the consumer durable goods industries. Prices on foreign steel are running 40 to 60 per cent above domestic steel prices, and the deliveries offered range from 4 to 10 months. And imports of the most-wanted product, sheets, are at the rate of about 50,000 tons a year, so sheet consumers are really getting little assistance from abroad.

Better Times Ahead — This sheet situation, Mr. Weiss' committee finds, will improve somewhat when ECA-financed facilities abroad, particularly three new French strip mills, begin production later this year and next year. We should then not only be

able to import more sheet steel, but the product of the new mills will conform to United States standards.

The committee, Mr. Weiss told STEEL, is preparing a report for the Economic Cooperation Administration, in the expectation that ECA will use the information in negotiating with European producers for the largest possible share of their output. The first objective will be to make more of the imported steel available to defense-supporting industries. After that bracket has been given attention, the committee will study the prospects for obtaining foreign steel for miscellaneous civilian requirements.

Bonus Steel—The committee's present thinking is that purchases of imported steel should not be counted in CMP allotments — but this matter still is to be determined.

Imports of carbon steel (excluding alloy steels, Swedish iron and other specialties) for 1950 and the first quarter of 1951 were:

Imports of Steel (Tons)

	Jan. 1951	Feb. 1951	Mar. 1951	Total 1950
Wire Rod	15,616	13,232	14,548	111,442
Galv.				
Boiler Plate	3,242	4,122	4,118	9,436
Ingots	10,960	4,860	4,216	115,388
Billets	13,401	10,360	10,512	60,990
Plates	31,212	50,160	25,609	154,124
Galv.				
Sheet, Plate	1,376	825	1,679	7,211
Sheets	7,375	5,131	3,553	50,160
Shapes	14,163	32,463	17,436	169,764
Piling	1,427	1,583	1,992	5,167
Rails	509	5,676	1,459	6,064
Tubing	19,529	20,562	19,723	40,376
Wire	3,064	4,796	7,649	24,518
Strip	578	190	629	1,126
Reinf. Bars	10,429	12,275	9,233	60,378
Bars	19,508	21,092	24,800	106,830
Tons Total	292,492	196,339	226,955	922,977

Steelmen Scour Orient for Scrap

Among members of the purchasing mission heading for Korea to look into the economic feasibility of shipping battlefield scrap metals to the United States (STEEL, July 30, p. 28) are L. S. McCall, assistant director of purchases, Columbia Steel Co., San Francisco; Arthur Snyder, assistant purchasing agent in charge of scrap metal purchases, Bethlehem Steel Co., Bethlehem, Pa.; and R. L. Lambourne, assistant purchasing agent in charge of scrap purchases, Kaiser Steel Co., Fontana, Calif.

The commission, government-sponsored, will determine the quantity of the battlefield scrap available for shipment to this country and will make recommendations for collection and handling. Some estimates have placed the amount of the battlefield scrap at more than 200,000 tons.

A seven-man committee representing the largest Japanese steel producers is in Saigon, Indo-China, to investigate the possibility of salvaging scrap from Japanese ships sunk during World War II.

An estimated 86 of the nation's vessels were sunk along the Indo-Chinese coast and rivers during the war. The committee, headed by Edmond Roland of Juji Mercantile Co. in Tokyo, would sponsor salvage by private sources if Indo-Chinese permission is granted. As much as 350,000 tons of scrap might be recovered.

The scrap shortage is so serious that a committee of nine senior executives of steel companies has been formed to add vigor to the drive for scrap iron and steel.

The new group to be known as the Steel Industry Scrap Mobilization Committee has as its first major job the mobilization of 2000 steel company representatives to comb the nation's industrial plants for dormant iron and steel scrap and pry it loose for remelting.

Chairman of the new committee is Robert W. Wolcott, chairman of Lukens Steel Co. Executive secretary will be W. T. Hoyt, who was director of the Salvage Division of the War Production Board during World War II and who recently was a special consultant on scrap and salvage for the National Production Authority.

Incentives for Tool Builders

A new pricing regulation and Defense Boss Wilson's orders liberalizing the machine tool pool order program should enable machine tool builders to meet defense goals

MACHINE TOOL builders are going to get a new pricing regulation within the next ten days.

That action, plus Defense Boss C. E. Wilson's orders liberalizing the rules under which the machine tool pool order program operates, is expected to enable tool builders to expand their production to meet defense goals.

Bigger Than Expected—How big the expansion program is to be nobody yet knows for sure, but it is expected to be much larger than anything thus far indicated, particularly if Congress authorizes the plan broached by Chairman Carl Vinson of the House Armed Services Committee. That calls for a 163-group Air Force, nearly twice the present strength and more than two-thirds above the present administration air power goal.

Office of Price Stabilization won't yet spell out in detail the coming machine tool price ceiling order, but it will probably be more liberal as to prices and profits than the existing orders, and may be on an interim basis to be used by the industry only as long as it is sharply expanding production. Once a high level of production is achieved, some other price order may be substituted or the industry might go under the existing machinery order, CPR 30, as amended by that time which would probably be around mid-1952.

Misunderstood—OPS says that the much criticized GOR 15 for machine tool builders was designed for the fast-expansion phase and was on a take-it-or-leave-it basis. Machine tool makers didn't have to go under it unless they wanted to, a point widely misunderstood, according to the agency.

Defense Mobilizer Wilson considers machine tool production a bottleneck in industrial mobilization. He has already loosened up on the tool pool program. Builders with pool orders who can't get financing from private sources for their contracts can get it from General Services Administration an advance of up to 30 per cent of the total amount of the contract. "Come in and ask for the advance," GSA told STEEL. "If a pool order holder can show that he has been unable to finance privately, he will get a GSA check forthwith."

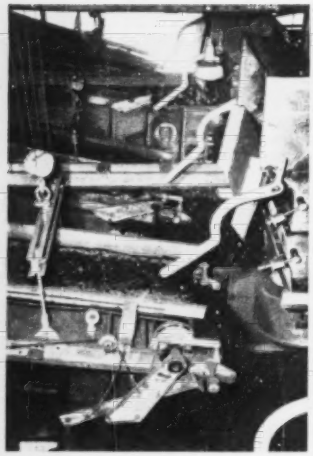
Tool Builders Get New Priority

Machine tool builders will have first call on the output of their own industry.

Effective immediately, machine tool builders who themselves are unable to obtain metalworking equipment may apply to the National Production Authority for assistance in getting it.

On application from a machine tool builder, NPA will review the order boards which the machine tool builders submit to NPA. When the needed tool is located, preferably available for immediate shipment, NPA after appropriate review will order the builder to divert the tool from his intended customer to the machine tool manufacturer who needs the tool for an expansion of his facilities.

Heretofore, machine tool builders had to obtain DO priority ratings, which then were filled in the order in which the DO rated orders were received by the manufacturers.



COAL GETS A CLEANING: Every hour 1275 tons of clean coal pour from the loading booms at the new Georgetown Preparation plant of Pittsburgh Consolidation Coal Co.'s Hanna Coal Co. Division near Cadiz, O. The new plant, largest coal cleaning plant in the commercial bituminous industry, cost more than $5 million to build

War Jobs for Toolmakers

Defense contracts increase in tool and die shops; labor pirating continues

TRUSTEES of the National Tool & Die Manufacturers Association, holding their quarterly meeting in Buffalo, report that defense business is on the upswing but that labor pirating continues to be a major problem.

The association members make the tools, dies and fixtures that are required before mass production of defense items can get under way. Trustees from every tool center in the country spent the major part of their business session discussing wage stabilization problems they plan to present before the special wage committee set up by the Wage Stabilization Board. That committee will make recommendations on wage and manpower policies in the tool and die field.

Bill of Particulars—Major labor complaints among tool and die companies are these: A number of tooling areas have the equipment to increase staff and output but cannot do so because of the tight skilled labor market. A number of areas are unable to train new workers because of draft deferment policies. Many local draft boards do not recognize the industrial importance of the tool maker and the necessity for long-term apprenticehip required to make a good tool maker.

Herbert S. Jahn, president of NTDMA and president of B. Jahn Mfg. Co. New Britain, Conn., disclosed in a business and labor report to the trustees that most areas except Cincinnati and western Massachusetts have orders for tooling and development on armament that approximate 50 to 75 per cent of their new business. In western Massachusetts, armament tooling orders represent 95 per cent of new business, mostly from large companies with prime contracts.

Labor Scoreboard—Mr. Jahn added that the Chicago area could use 500 more skilled men, the Cleveland area 400, Dayton 300, Indianapolis 200, Rochester 200 to 250, western Massachusetts several hundred. Most of the shops are on a 45 to 50-hour week, with 8 to 10-hour working days.

Tool and die shops report high business activity in most areas. Current indications are that business within six months will be even better than it is now. Prices obtained for tooling jobs are about the same as six months ago, but higher than a year ago. The area with the greatest difficulties in tooling supply and demand is St. Louis where the tooling program is beyond the capacity of the area's shops.

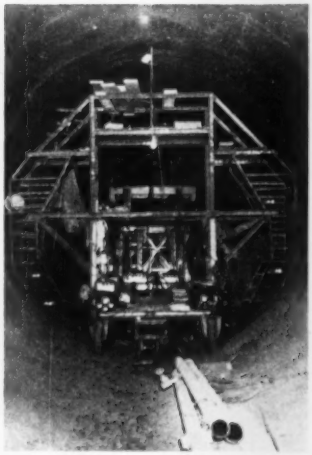
Titanium Output To Rocket

World output of titanium—wonder metal urgently needed for military and atomic energy applications—will rocket eight-fold when Titanium Metals Corp. of America swings its new Henderson, Nev., plant into action.

The company, jointly owned by National Lead Co. and Allegheny Ludlum Steel Corp., received a letter of intent from General Services Administration for construction of the world's first large scale and self-contained plant, capable of turning out 3600 tons of the precious element a year. Current production is about 500 tons a year—and is priced at some $21,000 per ton for all products.

Major components of the $150 million Basic Magnesium Inc. plant built by the government during World War II at Henderson have been leased. H. K. Ferguson Co. has a $14 million contract for the rehabilitation job. The Colorado River Commission has allocated an annual power supply of 151 million kilowatt-hours generated at nearby Hoover and Davis dams.

Operations at Henderson, expected to hit full stride by late 1952, will include production of titanium sponge and the melting of the metal into ingots of some 1000-2000 pounds.



JUMBO WELDER: Special welding "Jumbo" with four General Electric type WD-43 dc arc welders is rolled into place to weld another section in the 1138-foot all steel outlet tunnel of the new Lucky Peak Dam, being built on the Boise river. The pipe was fabricated by Olson Mfg. Co., Boise, Idaho, of ¾-inch and ½-inch steel

Key Fits for Lockmakers

They're doing well on defense work because their varied equipment can be used for war

A PROBLEM in lock manufacture—the necessity for much varied equipment to turn out the many parts required—is providing the key to the industry's success in landing defense contracts.

The average lock manufacturer is devoting 20 to 25 per cent of his lock production to defense, but that's not all. The diverse equipment in the field also enables him to turn out such defense products as buckles, hand grenades, shells, rockets and fuses. As a result, several of the major lock makers are devoting facilities to nearly 100 per cent war work.

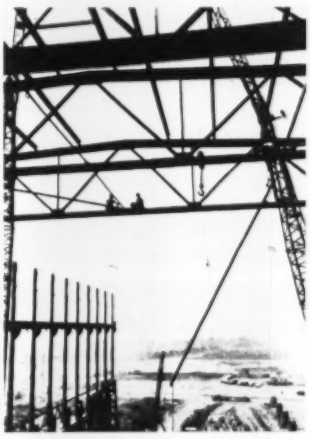
Intricate — A manufacturer that makes a wide range of locks could have stamping, casting, die casting and machining equipment. Some lock parts that will get rugged wear are even drop forged. Metal powder is being used increasingly in lock manufacture, and equipment is required to handle that material. The simplest lock—used, say, on truck bodies—may have only four parts, but one typical exterior door lock for a house has 21 parts, six of steel stampings, the rest of cast brass. A typical interior door lock for a home has 14 parts, many of them die cast. Die

casting is being used increasingly for the lighter locks. For die cast and other parts, a manufacturer sometimes relies on outside suppliers.

Some 75 to 100 lock manufacturers —only 15 of them large—turn out an estimated 100 million locks a year in the U.S. In the lock industry are two general classifications— building hardware and cabinet locks. Under building hardware are lock sets and night latches. Under cabinet locks are those used in the automobile industry, for tool boxes, lockers, desks, parking meters, office equipment, vending machines etc. Building hardware accounts for the largest portion of the business. Some 15 locks are used on the exterior and interior doors of an average six-room house. Another large lock user, the auto industry, uses three or four per car.

Essential Locks come under the "B" list in CMP and manufacturers are getting as good a deal as can be expected on materials allotments. Production thus far has not been appreciably hurt because of shortages. Some industry men believe, though, that the tangle in CMP may force a 20 per cent cutback by the end of the year. Because of the shortage of brass, zinc plated steel is being used increasingly for casings. Brass, bronze, aluminum and steel are the principal metals used.

Standardization to cut down on the myriads of different kinds of locks made has shown good progress since the war and is proving a godsend now to save on materials and equipment. Even though manufacturers know that the complexity of their operations—with the attendant need for several different types of equipment —is helping them on defense contracts, they are still working toward simplicity, and a peacetime economy.



SKYHOOK SQUAD: Balanced high above the ground at Morrisville, Pa., these workmen are erecting the steel framework for U.S. Steel's annealing building at the new Fairless Works. When completed in 1952, the plant will have a steelmaking capacity that will be about 1.8 million tons

New Foundry in 21 Working Days

Planning to remodel or rebuild part of your plant?

Then no doubt you've been wondering how long, really, it should take to do the job, how long your plant's production may be disrupted.

Most people feel that construction today is too slow. But it still can be fast. That was demonstrated when Superior Foundry Inc., Cleveland, had one of its foundry buildings replaced with a new one.

Castings production was interrupted only 21 working days (figuring a five-day week) during the replacement of an old building with a new one containing 60,000 square feet of floor space.

Here's a diary on the project: Some preliminary work was completed in the early part of June. The yard was cleaned, several small attached structures, not in use, were wrecked, and some of the walls of the main foundry were torn down. These operations did not interfere with production.

The last iron was poured in the old building on the night of June 28; the job was turned over to the general contractor on the evening of June 29. The old building, except a narrow section over the light castings conveyor loop, was torn down and the site made ready by July 1 for construction of the new building of steel, brick and glass.

On July 17, the first ladle of iron was run through the new building. By July 30 all of the equipment was in place and full production of castings on all floors in the area was resumed.

When all of the new equipment is in place by early 1952, the capacity of the rebuilt portion of the Superior plant will be increased 100 per cent.

Gear Plant Going Up in Indiana

Gear and differential output at Fairfield Mfg. Co., Lafayette, Ind., will be boosted by the end of this year when a new $2.5 million plant will be opened. The structure will provide Fairfield with 181,000 square feet of floor space to house office, engineering and manufacturing departments.

Reference Temperature Adopted

General adoption of a standard reference temperature of 20 degrees Centigrade (68 degrees Fahrenheit) is being recommended by the council of the International Organization of Standardization (ISO).

The recommendation concerns limit gages generally used for inspection of component parts in the mechanical and other industries. Since these parts and gages expand under increased temperature and contract when temperature is decreased, it was believed necessary to reach agreement on the reading at which their sizes will be acceptable.

Worthington Rebuilding Foundry

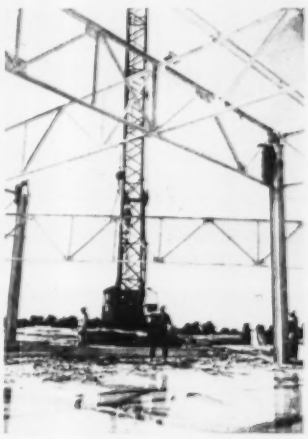
Modernization of its Oil City, Pa., plant is planned by Worthington Pump & Machinery Corp. Plans include re-equipping the present foundry and establishing a new electric power supply. Cost is approximately $500,000.

Ferroalloy Plant for Houston

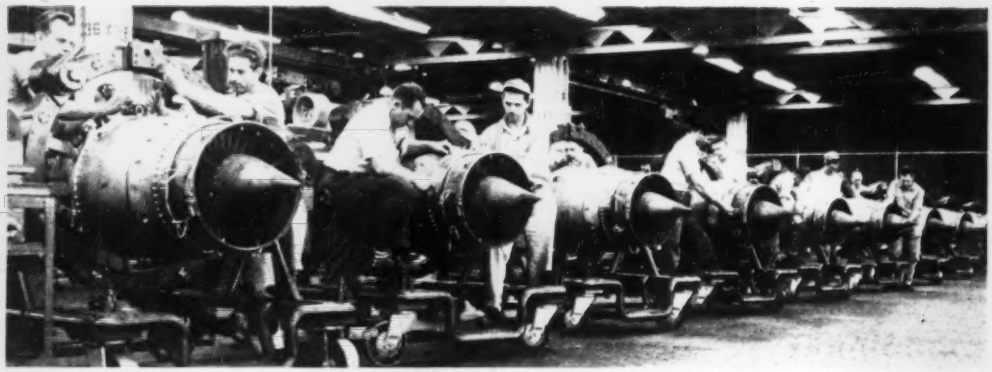
Ferromanganese and other alloys for Houston's expanding steel industry will be supplied by Tenn-Tex Alloy & Chemical Corp., which is building a $1 million plant in the Ship Channel area.

Location of the new firm in Houston will probably lead to the construction of a long-planned inbound bulk cargo handling plant by the Navigation District to handle imports of manganese ore, expected to reach about 5000 tons when Tenn-Tex is in full operation. Sheffield Steel Corp., which adjoins the site of the new plant, will use the bulk of Tenn-Tex production.

The new plant will be equipped with



AERIAL ACT: A new landmark near Wayne, Mich., is this Lincoln-Mercury assembly plant, which will be ready for occupancy next year. The 179-acre plant will house all Lincoln assembly operations now performed at the Detroit Lincoln plant, and the Mercury line at Ford's Rouge plant



NEEDLE TAILS: Rolling off the assembly lines only hours apart are these jet engines at Westinghouse turbojet plant in Kansas City, Mo. This group of new needle-tailed jets, each mounted on its own assembly dolly, gets finishing touches before installation in Navy carrier-borne fighters and interceptors. These engines power such fast new planes in the jet parade as the McDonnell "Banshee", tailless Chance-Vought "Cutlass" and Douglass F3D night fighter

three electric furnaces and will produce about 2000 tons of refined metal each month.

Sharon Sinks Exploratory Well

An exploratory well near Sharon Steel Corp.'s Roemer works at Farrell, Pa., may locate sources for a reserve of natural gas and fuel oil to augment Sharon's piped-in supply.

AISI Reports Fall Schedule

First of five regional technical meetings of the American Iron & Steel Institute this fall will be held at Hotel Thomas Jefferson, Birmingham, Sept. 26. Others will follow: Oct. 11 at the Warwick Hotel, Philadelphia; Nov. 9 at Hotel Mark Hopkins, San Francisco; Nov. 29 at Hotel Cleveland; and Dec. 13 at the Drake Hotel, Chicago.

Fairchild Division Expanding

Stratos division of Fairchild Engine & Airplane Corp. will build aircraft accessories in a $2 million plant going up at Bay Shore, Long Island. Manufacturing facilities will cover about 100,000 square feet, and a two-story office building will cover about half that area. Production at the new facility will begin in early Spring.

Convair Designing All-Jet B-36

A new swept-wing all-new jet version of the B-36 heavy bomber is being built by Consolidated Vultee Aircraft Corp. at Ft. Worth, Tex.

The new plane will differ markedly from B-36 design and performance.

GM Lands Instrument Contract

Ternstedt Division of General Motors Corp. will use a part of the Detroit Transmission Division plant to make N-1 compass systems for the Air Force. The instrument was developed by Kearfott Co. Inc., Little Falls, N. J., and GM is to make it under a licensing agreement that provides for engineering assistance, says J. L. Conlon, Ternstedt general manager. Mr. Conlon reports many of the components will be supplied by outside companies.

New Orders Hike Reeves' Defense Total to $45 Million

REEVES Instrument Division of Claude Neon Inc., New York, is becoming a contractor worth contacting for eastern instrument suppliers. The division reports it has new contracts from the Air Force, Navy and Signal Corps for production of gunfire control systems, radar systems, guided missile components and several classified items. The new orders total $25 million and bring the division's military backlog to more than $45 million.

Packard Motor Car Co. continues to spread around its assembly contract for production of the GE J-47 engine. Latest company to subcontract part of the big order is Gerity-Michigan Corp., Adrian, Mich., whose job it will be to make the compressor front frames. Another automaker, General Motors Corp., farmed out a "major component" of its job on the Republic F-84-F to Cessna Aircraft Co., Hutchinson, Kans.

Other contracts, awarded by the government and valued at more than $250,000, follow:

PRODUCT	CONTRACTOR
Bomb Assemblies	Schwayder Bros. Inc., Ecorse Station, Detroit
	Kold-Hold Mfg. Co., Lansing, Mich.
Fuzes	Regina Corp., Regina, N. J.
	Aldon Products Co., Duncannon, Pa.
	Free Sewing Machine Co., Rockford, Ill.
Modification Kits for 120mm AA gun mounts	Sperry Corp., Long Island City, N. Y.
Range Finders	Otis Elevator Co., New York
Fire Trucks	General Fire Truck Corp., Detroit
	Marmon-Herrington Co. Inc., Indianapolis
Refueling Trailers	Standard Steel Works, Kansas City, Mo.
	The Heil Co., Milwaukee
	Butler Mfg. Co., Kansas City, Mo.
Dolly Assemblies	Badger Northland Inc., Kaukauna, Wis.
Stand Assemblies	Bendix Aviation Corp., South Bend, Ind.
Compressors	Ingersoll-Rand Co., Cincinnati
	Chicago Pneumatic Tool Co., New York
Towing Vehicles 333	Harry A. Lowther Co., Shelbyville, Ind.
Hydrant Refueling Systems	American Pipe & Steel Corp., Alhambra, Calif.
Aircraft Fuel Meters	Granberg Corp., Oakland, Calif.
Heaters	Surface Combustion Corp., Toledo, O.
Engine Hoist Assemblies	Robbins & Meyers Inc., Springfield, O.
Engines packette type:	Continental Motors Corp., Muskegon, Mich.
Mobile Training Units	Republic Aviation Corp., Farmingdale, L. I., N. Y.
Power Plants	ACF-Brill Motors Co., Philadelphia
Power Transformers	Pennsylvania Transformer Co., Canonsburg, Pa.
Radio Transmitters	Radio Receptor Co., Brooklyn, N. Y.
Radio Receivers	Cincinnati Electronics Co., Cincinnati
Radio Direction Finders	Belmont Radio Corp., Chicago
Radio Sets	Olympic Radio & Television Inc., Long Island, N. Y.
	Federal Mfg. & Engineering Corp., Brooklyn, N. Y.
Radar Sets	Webster-Chicago Corp., Chicago
Generator Sets	The Buda Co., Harvey, Ill.
Pulse Generators	Stamford Electronics Co., Stamford, Conn.
Materials & construction for airmen's mess and dormitories, hangar and control tower at Ft. Dix, N. J.	Fred J. Brotherton Inc., Hackensack, N. J.

CHECKLIST ON CONTROLS

GOVERNMENT control orders are digested or listed each week in this "Checklist on Controls." For complete copies of NPA orders, write to NPA Distribution Section, First Basement, New GAO Bldg., Washington 25. For copies of OPS orders, contact nearest OPS district or regional office. For copies of OPS news releases, write David S. Phillips, director, OPS Administrative Services Division, Temporary E Bldg., Washington 25.

Materials Orders

SOLE LEATHER—NPA Order M-34 was revoked July 31, 1951, because it was considered no longer necessary.

CONSUMER DURABLES — Amendment of August. 2, 1951, of NPA Order M-47A increases flexibility in the use of iron and steel quotas in production of consumer durable goods. The change permits a manufacturer to vary his production of items as he would under normal competitive conditions, makes it possible for him to benefit from any savings of materials in his manufacturing process, and allows manufacturers to disregard, in computing both base period and actual usage, the weight of materials contained in purchased components or subassemblies for which a CMP allotment for the third quarter was issued.

STEEL—Direction 2 to NPA Order M-1 confirms telegraphic instructions between July 5 and July 25 to steel producers regarding lead time for September, acceptance of rated orders, distributor and converter orders, alloy and stainless steel orders, and carryovers. Direction 2 was issued Aug. 2, 1951.

STEEL DISTRIBUTORS — Direction 2 to NPA Order M-6 confirms telegraphic instructions between July 5 and July 25 to steel producers concerning shipments to steel distributors in October, 1951, and subsequent months. Direction 2 was issued Aug. 2, 1951.

GOATSKINS—Amendment of Aug. 1, 1951, of NPA Order M-62 increases amounts of goatskins and certain other hides and skins that tanners may process.

STEEL—Amendment of Aug. 2, 1951, of NPA Order M-1 confirms telegraphic instructions between July 5 and July 25 to steel producers concerning Table I (lead time and set-asides of steel) of M-1. Set-asides were increased.

SOFTWOOD PLYWOOD—Amendment of Aug. 3, 1951, of NPA Order M-63 increases amount of softwood plywood that manufacturers must set aside each month, starting with September, to fill defense-rated orders.

CONSTRUCTION—Controls over construction were revamped as follows: NPA Order M-4 was revoked Aug. 3, 1951, and was replaced on that date by M-4A which provides in general that no person may commence any construction that requires more than two tons of carbon steel, 200 pounds of copper, and any quantity of aluminum, alloy steel or stainless steel without authorization and allotment of materials. CMP Reg. 6 was amended Aug. 3, 1951, to halt or prohibit construction on projects that have not been given an authorized construction schedule and related allotment of controlled materials. Direction 1 to CMP Reg. 6 was issued Aug. 3, 1951, and establishes procedure whereby persons may place authorized controlled materials orders and defense-rated orders for construction materials where total requirements do not exceed specified quantities. NPA Delegation 14 and NPA Order M-74 were amended and NPA Delegation 7 was revoked Aug. 3, 1951, to make them conform with the new construction regulations. Amendment of M-74 adds six items to the list of those whose use of copper is restricted, and revoking of Delegation 7 returns processing of construction applications from Commerce Department field offices to Washington.

MINING INDUSTRY — NPA Order M-78 issued Aug. 6, 1951, and effective that date, expands priorities assistance in procurement of maintenance, repair and operating supplies by certain segments of the mining industry. The new order does not apply to the solid fuels, petroleum, uranium or natural gas segments.

LABORATORIES—Amendment of Aug. 6, 1951, of NPA Order M-71 liberalizes priorities assistance to scientific and technical laboratories.

Controlled Materials Plan

CONSTRUCTION — Amendment of Aug. 3, 1951 of CMP Reg. 6 provides that, except where specifically provided otherwise by NPA, no person may continue construction already commenced or commence construction unless he has received an authorized construction schedule and related allotment of controlled materials.

BACK ON THE JOB: As a riveting team during World War II, these girls worked on fabrication of B-24 bombers at Willow Run. Now brushing up on their skills at Kaiser-Fraser Corp.'s aircraft training school, they'll help build the Fairchild C-119 transport planes that K-F is turning out for the Air Force

CONSTRUCTION — Direction 1 to CMP Reg. 6 establishes the procedure whereby persons may place authorized controlled materials orders and defense-rated (DO) orders for construction materials (calling for delivery after Sept. 30) for projects where the total requirements do not exceed specified quantities. Direction 1 was issued Aug. 3, 1951.

PRINTING PLATE—Direction 1 to CMP Reg. 5 establishes for the printing industry a definite procedure for obtaining printing plates. Direction 1 was issued Aug. 3.

CONSTRUCTION—Amendment to Direction 2 of CMP Reg. 3 provides that orders for products and materials other than steel, copper or aluminum placed and accepted at any time for third-quarter delivery for certain defense-supporting construction programs, will continue to have top preferential position. The amendment of Direction 2 was issued Aug. 3, 1951.

Price Regulation

MANUFACTURERS—Amendment 1 of Supplementary Regulation 12 to Ceiling Price Regulation 22 sets Oct. 1, 1951, as the effective date for establishing ceiling prices on specific manufactured commodities listed in SR 12.

How You Must Figure Prices

If your firm is covered by the general manufacturers' pricing order (CPR 22) and related manufacturing pricing regulations you must figure your new ceiling prices under the provisions of these orders as they existed before the new Defense Production Act became effective Aug. 1.

Confusion has arisen over the point, Office of Price Stabilization says, because of the so-called Capehart amendment to the Defense Production Act, providing that ceilings on materials and services must reflect increases or decreases in costs, including overhead, up to July 26.

Some manufacturers are under the impression that they may calculate their ceilings on the basis of the Capehart amendment rather than the formulas spelled out in the manufacturing orders.

That impression, says OPS, is false. The manufacturing regulations, having been issued before enactment of the amendments to the Defense Production Act, remain in effect. These regulations do not provide for increases in overhead costs.

The Capehart amendment does provide that "upon application and a proper showing of . . . prices and costs," OPS shall adjust ceilings to reflect changes in costs, including overhead, up to July 26, 1951, a somewhat later cut-off date than used in the manufacturing regulations.

Windows of Washington

By E. C. KREUTZBERG *Washington Editor*

Industry is finding radioisotopes handy things to have around. AEC made 18,900 shipments in five years. One of the popular uses: Radiocobalt for radiographic inspection

GROWTH in the radioisotopes distribution program in the past year has come about largely because of industry's increased interest, says Atomic Energy Commission.

Radioactive cobalt as a source of radiation for the testing of castings and welds symbolizes industry's increasing use of radioisotopes, AEC reports. Used in radiographic inspection, the radioisotope cobalt 60 supplies the necessary radiation for taking a photograph of any flaws or cracks not otherwise visible in a cast or weld.

Giant Steps—The amount of radiocobalt shipped during the past 12 months has increased 564 per cent over the total amount shipped during the first four years of the program. Shipments of the other two leading isotopes, radioactive iodine and radioactive phosphorous, increased 94 and 54 per cent respectively. Some 72 industrial companies are currently using radiocobalt for radiography.

Among numerous new industrial applications of radioisotopes which have just come to light are: A method developed by the Rock Island Arsenal in Illinois for determining the concentration of sulphur in chromium plating baths; a technique used by Carnegie Institute of Technology in Pittsburgh for measuring the self-diffusion of cobalt; a test developed by the research laboratories of Atlantic Refining Co. in Philadelphia for forecasting the extent of deterioration of asphalt roads due to the action of water.

Private Proposals — Industry wants more part in the isotope production program. Bendix Aviation Corp., Detroit, and Tracerlab Inc., Boston, have made proposals to the AEC to investigate the feasibility of privately owned and operated radioisotope production and large-scale processing facilities. Their studies will get underway soon. Stanford Research Institute of California has completed a survey of the possible industrial use of large-scale sources of radioactive fission products, and a report of that survey is expected in the next few months. Abbott Laboratories, a pharmaceutical supply company in North Chicago, Ill., will soon establish a small isotope processing unit in Oak Ridge.

Most of the radioactive and stable isotopes distributed come from Oak Ridge, operated for AEC by Carbide & Carbon Chemicals Co., division of Union Carbide & Carbon Corp. In the last five years AEC facilities have made more than 18,900 shipments of radioactive isotopes and 1550 shipments of stable isotopes for studies in some 610 U. S. institutions.

In and Around the Capital . . .

John V. Freeman was appointed coke and coal chemicals consultant in the Defense Solid Fuels Administration. He retired from U.S. Steel in February after serving 43 years in coal chemical sales and coal research. Since March he operated in New York as an independent consultant on coke and coal chemicals. . .

Canada's Department of Defense Production established a U.S. liaison office at 2001 Connecticut Ave. N.W., Washington. It will expedite work in which the U.S. and Canada are interested. . .

Col. Reginald Whitaker, engineer officer in Berlin, Germany, since 1947, was appointed district engineer in Baltimore for the Corps of Army Engineers. . .

Alternates for Shortages . . .

A Housing & Home Finance Agency-approved emergency building code ordinance that will permit building officials to authorize use of alternate materials in the period of shortages will soon be available in printed form. If you manufacture metal building supplies, you may be interested, for instance, in a plastic or porcelain outlet box instead of one made of steel. Or, if you want to save on the weight of structural steel, the emergency code points out that you can use lightweight aggregates instead of heavier sand and stone in buildings. Another provision would save steel by increasing stress allowances on steel members.

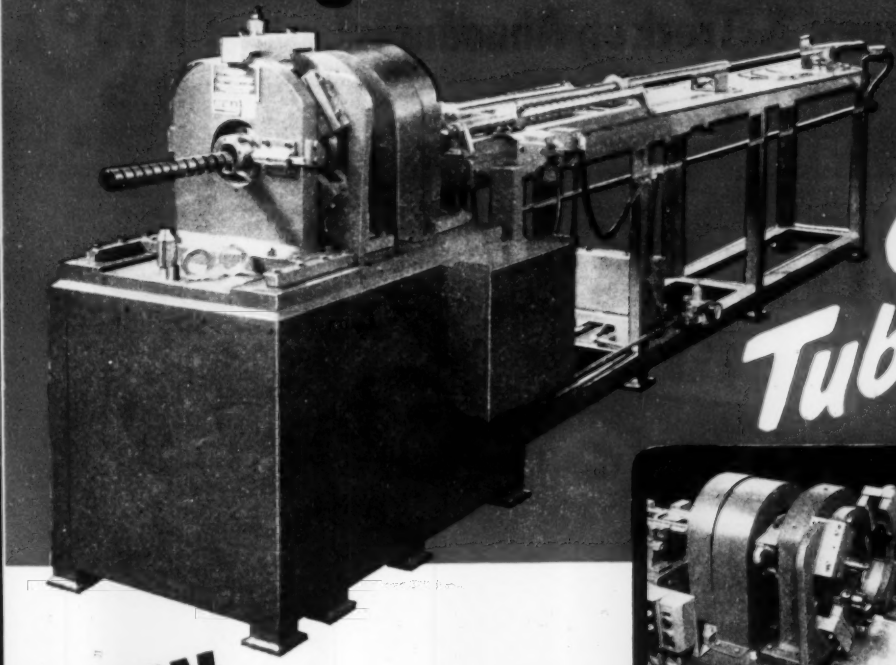
Labor Movement—Pocket-Size . .

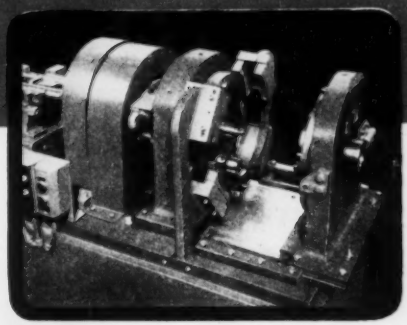
Industrial relations and personnel men—for that matter, anyone interested in labor matters—can now get a pocket-size book that summarizes recent legislation and the development of collective bargaining. It's "A Brief History of the American Labor Movement," prepared by the Bureau of Labor Statistics. You can get copies for 25 cents from the Superintendent of Documents, Washington 25.

NEA

BIG TALK ABOUT SMALL GUNS: At this weapons standardization conference at the Pentagon, defense officials of four Atlantic Pact nations are trying to agree on standardization of the rifle and other small arms and their ammunition. The conference followed a British announcement that she plans to adopt a new 0.280 caliber rifle as standard weapon for the British army. Left to right are: Secretary of Army Frank Pace; Jules Moch, French Minister of National Defense; Emmanuel Shinwell, British Defense Minister; Brooke Claxton, Canadian Defense Minister

Looking for a Better Way to Cut Tubing?





NEW DUNCAN-McKAY TUBE CUTOFF IS YOUR ANSWER . . .

CHECK THESE OUTSTANDING FEATURES

√ SIMPLICITY OF DESIGN	With economy in mind.
√ SIMPLICITY OF SET UP	Ordinary shop personnel entirely competent after brief instruction.
√ SIMPLICITY OF OPERATION	Fully automatic—fool-proof.
√ SPEED OF OPERATION	Rates as high as 60 cuts-per-minute, depending on length of cut tube.
√ NO LOSS OF METAL	Tube wall is sheared—no metal removed.
√ QUALITY OF CUT	Practically burr free.
√ TUBE STATIONARY DURING CUT	Eliminating chances of marking.
√ CONCENTRICITY OF TUBE	Original concentricity maintained.
√ LENGTH TOLERANCE	Positive stops control travel of feed cylinder—close length tolerances easily maintained.
√ TOOLING	Simple, concentric dies—easily produced in your own tool room.
√ LOW MAINTENANCE	Early models have been in continuous operation—over 2,000,000 cuts with only occasional die grinding required.

The McKAY MACHINE Company
YOUNGSTOWN, OHIO

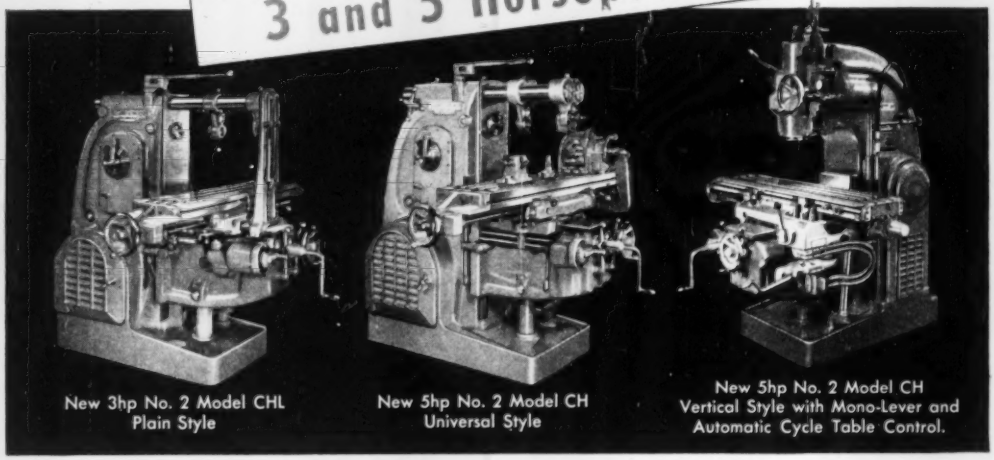
McK

ENGINEERS AND DESIGNERS OF EQUIPMENT FOR THE AUTOMOTIVE, FABRICATING AND STEEL INDUSTRIES

Kearney & Trecker Announces . . .

THREE NEW KNEE-TYPE MACHINES

3 and 5 Horsepower



New 3hp No. 2 Model CHL Plain Style

New 5hp No. 2 Model CH Universal Style

New 5hp No. 2 Model CH Vertical Style with Mono-Lever and Automatic Cycle Table Control.

New Kearney & Trecker No. 1 CH, No. 2 CHL and No. 2 CH Milling Machines (Plain, Universal, and Vertical Styles) have every performance-proven operating and construction feature needed for modern short-run or production milling requirements

These specifications point up the new larger working ranges of these new machines. You'll find they provide you with new major cost-cutting possibilities for tool-room and production work. Feeds and speeds listed are standard ranges. Optional ranges available.

Machine	Working Surface	TABLE Power Feed Travel — Plain & Universal	TABLE Power Feed Travel — Vertical	Feeds Number & Range	Power Rapid Traverse — Per Min.	SPINDLE Nat'l Std. Taper	SPINDLE Speeds — Number and Range
No. 1 Model CH Plain, Universal and (swivel head) Vertical	40" x 10"	Long. 22" Cross 8" Vert. 17"	22" 10" 16"	16—½" to 32" 16—¼" to 16"	150" 75"	40	16 — 25 to 1500 RPM
No. 2 Model CHL Plain, Universal and (swivel head) Vertical	46" x 10"	Long. 28" Cross 10" Vert. 17"	28" 10" 16"	16—½" to 32" 16—¼" to 16"	150" 75"	40	16 — 25 to 1500 RPM
No. 2 Model CH Plain, Universal and sliding head) Vertical	50" x 12"	Long. 28" Cross 10" Vert. 18"	28" 12" 15"*	16—¼" to 32" 16—⅛" to 16"	150 — plain & vert. 100 — universal 75 — plain & vert. 50 — universal	50	16 — 25 to 1500 RPM

*Add 4" vertical travel for sliding head

If you're looking forward to modernizing your tool-room or milling machine line—you can't afford to overlook these new 3 and 5hp knee types. They offer you more practical operating features and heavier construction than any comparable equipment. They're designed to answer today's milling needs — and tomorrow's as well. For complete data on these machines, contact your nearest Kearney & Trecker representative or write direct. Kearney & Trecker Corp., 6784 West National Avenue, Milwaukee 14, Wisconsin.

KEARNEY & TRECKER MILWAUKEE MACHINE TOOLS

ECA: A Foreign Policy That Works

Western Europe's industrial output—with ECA's help—hits a record of 44 per cent above prewar levels. Britain does the best with a 62 per cent jump

HERE'S one U. S. foreign policy that's working: Western Europe's industrial production, with the help of ECA, has hit a new alltime peak of 44 per cent above prewar output.

The cumulative impact of ECA financial aid is such that Marshall Plan purchase approvals issued for 17 Western European countries in fiscal 1951 totaled $2,161,900,000, a 40 per cent drop from the 1950 fiscal year total of $3,592,090,000.

The Peak in April—Western Europe's new record in industrial output was reached in April, 1951, the latest month for which complete production figures are now available. In that month, output in the United Kingdom jumped 62 per cent over the 1938 prewar production; 52 per cent in the Netherlands; 40 per cent in France; and 17 per cent in West Germany. The German showing was 30 per cent better than a year before.

Western Europe's growing ability to produce the industrial goods it needs was reflected in the types of commodities for which Marshall Plan purchase approvals were issued in fiscal 1951. Machinery and equipment, which was the leading commodity in 1950, was fifth among the goods requested by Western Europe in the 12 months ended June 30. Coal was among the leading commodities purchased through ECA in 1951, but there were no Marshall Plan coal purchase approvals in fiscal 1950. That's because Europe's coal production did not keep pace with the rate of increase in industrial output.

A Lot of Money—The Marshall Plan purchase approvals issued during fiscal 1951 brought the cumulative total for Western Europe—since Apr. 3, 1948—to $11,663,300,000 as of June 30, 1951. The largest single item in the 1951 authorizations was $350 million for the capital fund of the European Payments Union. Other items in the 1951 fiscal year total were: Food and agricultural commodities, $940.3 million; industrial commodities, $677 million; ocean freight, $135.8 million; ship disbursements, $2.1 million; technical services, $18.4 million. The largest metalworking items in industrial commodities were $121.7 million for machinery and equipment, $68 million for nonferrous metals and products and $37.5 million for motor vehicles, engines and parts.

The nations with the largest Marshall Plan purchase approvals in fiscal 1951 were West Germany with $401.8 million; France $390.9 million; Italy $238 million; Greece $154.5 million; United Kingdom $151.5 million (aid ended Jan. 1, 1951); Austria $118.2 million; and the Netherlands $104.6 million.

The Nationalization Ax Falls

The ax has fallen on some members of boards of directors for British nationalized steel companies.

The greatest chopping has occurred in Thomas Firth & John Brown Ltd., a firm specializing in high grade steels. Seven board members of that company resigned after a heated exchange of correspondence with S. J. L. Hardie, chairman of the Iron & Steel Corp. of Great Britain. The problem in this instance was that six of the seven board members were also on the board of John Brown & Co. Ltd., a shipbuilding firm that until nationalization controlled Thomas Firth & John Brown. Mr. Hardie's position is: "No interlocking directorates."

Other nationalized companies from which some directors have resigned or whose re-election was opposed by the state were English Steel Corp. and Gjers, Mills & Co. Ltd.

The disagreement between Mr. Hardie's corporation and the private British Iron & Steel Federation on supplies of raw materials has been patched up. The federation will continue to buy the required raw materials for private and public steel firms although the state corporation makes it clear that the arrangement is merely a stop-gap one. The final setup is still to be determined.

Pin Pricks in Germany

German unions are continuing a pin prick campaign—it may evolve into ax-wielding tactics—for nationalization of the republic's steel and coal unions.

When it was announced that the old German steel company stock shares would be exchanged for shares in the newly established companies organized under the Allied High Commission, the unions announced they would not be members of the Body of Steel Trustees and the German Coal Industry Control. The reason: Labor fears control of the new steel companies by the same old steel barons of the past.

German labor may return to the public regulatory bodies set up under the Bonn government's decentralization program, but the drive to get more voice in management goes unabated. The unions also want more say in the publicly owned German railways and I. G. Farben. They may win their point with the railroads first because the lines have long been publicly owned.

TEMPO AT TEMPELHOF: If the Russians maintain their strict limitation on exports from Berlin the number of planes taking off from Tempelhof airfield is bound to increase. Tired of seeing goods piling up because of Soviet restrictions, the Western Powers launched a small-scale "commercial airlift." Here, the first cargo is put on a four-engined British Tudor.

Gearing Up for Defense

Gear makers expect their business this year to be double that of last year. Manpower is a headache, but materials aren't yet. They may be because 100 per cent defense work is anticipated in six months

THE GEAR INDUSTRY which supplies the toothed mechanical devices that transmit drive, power or motion to many industries is itself driving along in high.

It was smoothly turning out gears in the first half of last year (average monthly sales index was 334 per cent of the 1935-1939 average) when the Korean war speeded it up. By the end of 1950 its sales index wound up at 457.2 (see chart). Although estimates of a 100 per cent increase in sales volume are heard from the more optimistic, it is quite probable that the sales volume will be about double last year's. For June, the latest month for which figures are available, the sales index was 800.9.

Surge in Output The defense effort accounts for about 60 per cent of finished gear shipments. Rated work is steadily gaining. The surge in rated orders will account for nearly 100 per cent of production by the end of the fourth quarter. To date the National Production Authority has approved all requests for rated work.

BIG OR LITTLE in size, gears are the driving force in many industries. Their importance truly makes them an important cog in the defense machine. In six months 100 per cent of gear business may be for rated work

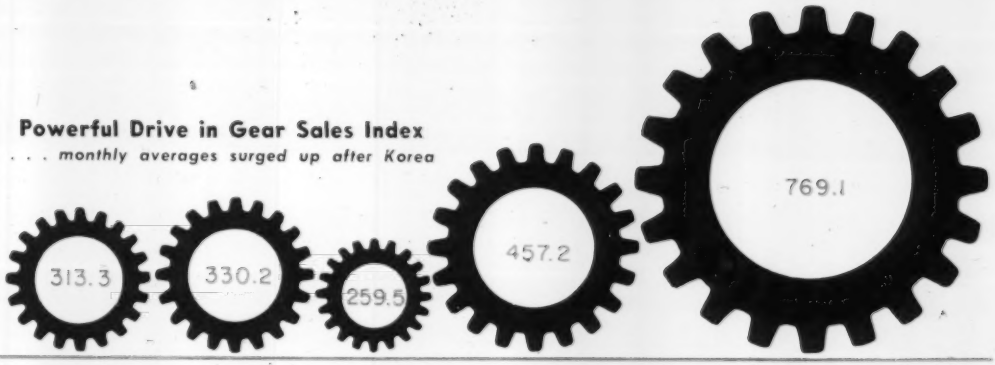
The increased demand for gears resulted quite naturally in large order backlogs. Four to six months is an average backlog although cases of eight months are not uncommon. Before Korea the average backlog was 30 to 60 days. Since much of the industry's work is maintenance, delivery is often required within a few days or, at the outside, a week and delivery can often be effected by stocking the most common requirements of customers.

The Gamut There is hardly a device marketed that does not use gearing—either in the device itself or in the machines that make the product. Gears range in size from less than 1/32 of an inch in diameter (you can barely count the teeth with a microscope) to over 15-foot pitch diameter. Materials from which gears are made are likewise extensive. The first gears were made of wood and some still are—like the plastic-impregnated laminated-wood spur gear for printing presses. The industry also uses nylon—Chevrolet, for one, uses a nylon gear to drive its speedometers. More common mate-

GEAR MAKERS ARE LOCATED IN EVERY STATE IN THE UNION
. . . each state has one at least that can make gears to order

Powerful Drive in Gear Sales Index

. . . monthly averages surged up after Korea



*Based on American Gear Manufacturers Association index for the first six months of 1951. Source: AGMA

rials, though, are aluminum, bronze, steel, iron, rawhide, Bakelite and fabric. Titanium gears are being used now in some quantity for propulsion gearing in jet aircraft; the application of that material is bound to increase.

Pressure for Speed — Powdered metals will find greater use in gear manufacture — for certain applications, but size of gears can limit use of the process. Plastics, too, will come in for greater respect because of their inherent properties: Resilience, self-lubrication (under certain conditions) and ease of manufacture are the outstanding points in favor of the plastic materials.

Pressure for greater speeds, more precision and lighter weights in gears are bound to show up in industrial speed reducers and gear assemblies.

Since the various kinds of materials have their own characteristics (not all of which are desirable for any one application), the American Gear Manufacturers Association (AGMA) is always working on new applications and latest developments in the industry. It also keeps its members posted on what's going on in industries that are major users of gears, but its information is not restricted to members only.

Big Gears and Little — Major users of gears are the automotive, aircraft, marine, machine tool, chemical, oil, rubber, mining, steel and instrumentation industries. Largest unit user of gears is probably the business machine industry which uses as many as 500 gears in one machine. Largest gears are used in the cement, pulpwood, steel and marine industries. Costliest ones are for ship propulsion, aircraft and the steel industry. Big user of little fine-pitched gears is the instrumentation industry.

Since the manufacture of gears is a sideline with many companies that don't consider themselves a part of the gear industry, the exact size of the industry is shadowy. A 1948 Census Bureau mentions 400 companies. Highly likely: A fair share of the 400 (about 150) operate on a small scale and under captive conditions. As a matter of fact, most regular members of the gear industry operate on a job-shop basis. A few companies are strictly jobbing shops, catering to local markets; practically all of the companies, even though they might manufacture cataloged items for national distribution, operate a jobbing business of their own.

Major industries like the aircraft, automotive, and machinery manufacturers handle the larger part of their gear requirements in their own shops. Many captive shops sell gears on the open market occasionally, but industrial gear makers look on the captive shops as a completely different breed.

There's One Near You — Gear makers are scattered over the whole country. Heaviest concentration is in the Chicago area. Every state has at least one company that can supply gears made to order. The industry's members vary in size from small organizations operating a three or four-man shop (with a net worth, say, of $50,000) to organizations doing a gross business of over $5 million a year.

Greatest demand on the industry today is for spur gears of all sizes — and that despite the greater availability of spur-gear manufacturing equipment. Herringbone gears run a close second in the demand race. One manufacturer reports a two-year backlog. That's a direct result of the difficulty in procuring herringbone-gear making machinery. Helical, bevel and worm gears are also in great demand.

Headaches — Major complaint heard from gear makers is that gear-processing equipment is difficult to obtain. One non-rated order promised for last April will not be delivered till September, if then. Ball bearings are a supply headache to gear-drive manufacturers — and quite logically to manufacturers of gear-making equipment. Some of the big names in gear making equipment are Barber - Colman Co., Rockford, Ill.; Gleason Works, Rochester, N. Y.; and Fellows Gear Shaper Co., Springfield, Vt. New non-rated orders are turned down cold by the machinery makers. Estimates are that 90 per cent of the gear-making machines on order are for defense work. That heavy rated backlog is not duplicated in gear-making tools, though; delivery can be made in three weeks.

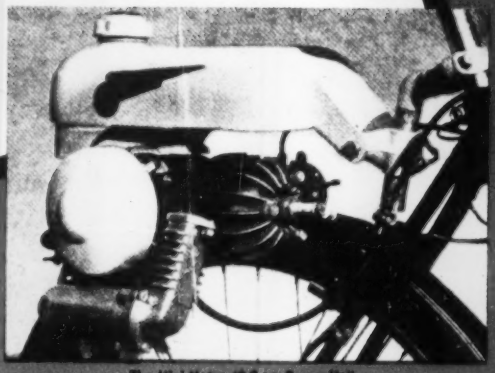
Bronze and steel are the materia's headaches. In Detroit great pressure is for bronze; in Pittsburgh the pressure is for carbon bars over 3 inches in diameter. The industry does a reasonable amount of mill buying, but the size factor of gears usually limits the producer in his direct mill purchases.

Since warehouse buying is so common in the gear industry, many executives are trying to get an assured supply of materials for gear blanks and shafting. But whether assured supplies are obtained or not, the materials pinch will probably hurt in the fourth quarter: Production may have to be curtailed.

Perennial Problem — Skilled machinists would be welcomed with open arms in the gear-making industry. Availability of experienced gear makers is practically nil. It may well be the obstacle that keeps the industry from meeting its expected sales volume. At best the industry was never a high-paying field; now wage stabilization regulations prohibit all but limited attempts to adjust the wage level upward. Competition from higher-paying industries makes the going rough for gear manufacturers.

The Well Known MULT-AU-MATIC METHOD

An excerpt from the publication "English Machinery"



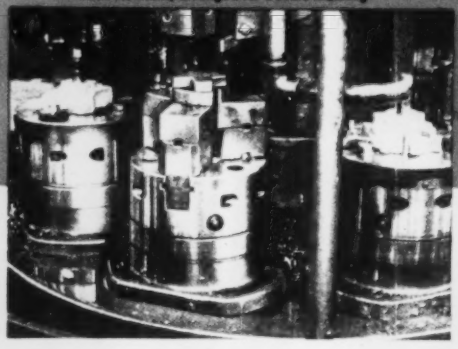
The Mini-Motor 49.9-c.c. Power Unit

The Production of the MINI-MOTOR . .

"Methods employed at the Croydon Works of Trojan, Ltd."

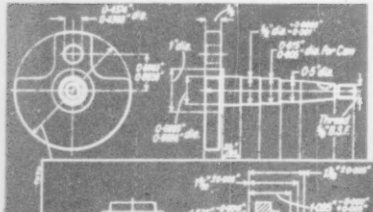
Although the activities of Trojan, Ltd., are mainly concerned with the manufacture of Trojan vehicles, both in I.C.-engined and electrically-powered versions, the Trojan engine, diesel engines, and many other products, the Mini-Motor has now assumed a position of considerable importance in this programme. This unit, which is at present being produced at the rate of 1,000 a week, is shown above, and comprises a 49.9-c.c. 2-stroke petrol-engine and fuel-tank that can be attached to any ordinary pedal-cycle by means of a few simple fittings. The fuel-tank, which is of rigid construction, serves as a mounting-chassis for the engine.

Machining Crankshafts and Crankcases Simultaneously on a Bullard Mult-Au-Matic, arranged for Double-Indexing

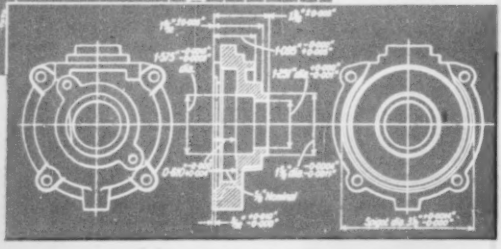


Whereas the Bullard Mult-Au-Matic Method is only one of the numerous phases of Trojan, Ltd. manufacturing processes, it speaks well for Bullard that Mult-Au-Matic was selected for one of the more accurate and important jobs.

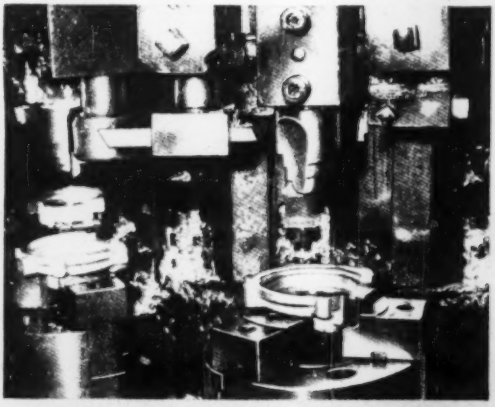
Rotor-portion of Crankshaft



Rotor-side Crankcase Casting



Machining mating Faces and registers on the Crankcase Castings



THE BULLARD COMPANY - BRIDGEPORT 2, CONNECTICUT

By A. H. ALLEN *Associate Editor*

Mirrors of Motordom

Auto output continues to skid. New models would help sales, but many tooling programs had to be dropped. Ford got under the wire and may make big changes

DETROIT

AUTOMOBILE PRODUCTION continues to ease off under the combined pressure of scattered strikes, materials shortages and plant closings for inventory.

No reversal of the trend is seen before Labor Day and unless sales show a little more zip than currently there is not likely to be any major acceleration of output. Relaxation of credit terms is figured to furnish a shot in the arm to lagging buyers but it may take something more than that—perhaps some new models.

Ford May Change—It is difficult to assess the new model picture clearly. Some planned changes were called off because of interference with defense production. Others were too far advanced to suspend. Much of the tooling activity around here at the moment is for Ford which apparently will come through with some fairly sweeping modifications in its body lines.

The big effort is being made to work out more interchangeability between Ford and Mercury bodies, much in the way that General Motors does with its A, B and C series, and the latest O-B series. Savings in die costs are appreciable when identical components can be used on several makes of bodies, a fact which Chrysler also has taken advantage of by duplicating parts of Dodge-Plymouth bodies as well as the Chrysler-De Soto designs.

Also on deck for Ford is a new overhead valve 6-cylinder engine to be built in the company's Cleveland engine plant. Apparently Ford is out to give battle to Chevrolet in the 6-cylinder field as schedules will call for around 2300 sixes a day on a two-shift basis. The plant also will build a new V-8 for Mercury at a similar production pace. Much of the machinery is in place and has been given a proof run. It will probably be toward the end of the year before any production engines are coming off the lines. The production foundry at Cleveland, directly behind the engine plant, is some distance from completion and probably will not be pouring any iron until January.

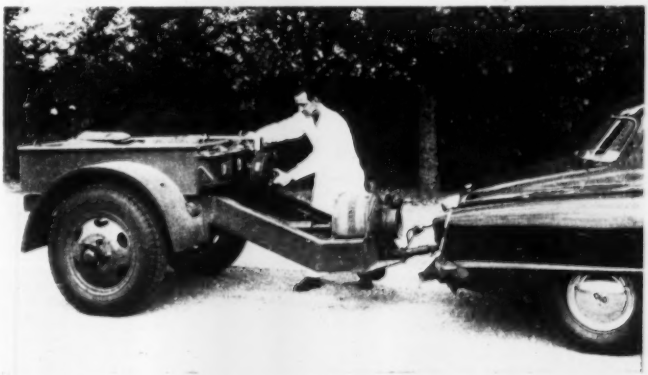
The Hard Top Carves Its Niche

Sensational popularity of the hard-top convertible body continues throughout the industry and makes it a sure bet for further expansion. The style has far outdistanced regular convertible models and despite its rather high price tag has taken a large bite out of two-door sedan production. In six months of this year hard tops accounted for approximately 10 per cent of GM and Ford passenger car output, with Chrysler scheduling around 5 per cent since Plymouth was not in the picture in the first quarter.

Principal drawback to building more hard tops is the large amount of chrome plating they require. Side windows must be framed with plated reveals, along with generous splashes of bright molding around doors, rear window and windshield. Most of this plating is strictly nonfunctional and it is impossible to obtain nickel for these applications. The possibility is seen that the new "white brass" plating (STEEL, Aug. 6, p.57) can come to the rescue although thus far this system has been confined to interior parts. General Motors has adopted a specification covering the technique but so far as is known other manufacturers have made no formal moves in this direction. All have had samples and some shipments of parts like screws with white brass plating under the chrome.

On the Matter of Shortages

Another of the critical alloying metals, molybdenum, has been the cause for some apprehension, particularly in the tool steel field where a change from high-tungsten (M-1) to the molybdenum (M-2) types of steel has been practically mandatory. A principal source for molybdenum is the Colorado mines of Climax Molybdenum Co. The ore is relatively low in molybdenum content and operations thus far have called for moving an enormous tonnage of rock for the amount of metal realized. Now it develops, according to information from a leading supplier of cutting tools, that a deposit with twice the molybdenum content is being neared and probably will be worked by the end of the year, if not sooner, as the overburden of lower



W-H-O-A: Slowing down autos is the job of Studebaker Corp. engineers using this Dynamometer Drawbar at the company's 800-acre proving grounds. The trailer apparatus can produce the road load effects of a variety of abnormal road surface conditions, duplicating the resisting equivalent of deep sand, clinging mud, steep hills or long upgrades. Setting up various engine load conditions not only tests cooling efficiency of cars and trucks but puts every moving part under constant stress. Running periods are from 1 to 5 hours

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grade ore is gradually removed. This is good newsc to the thousands of users of molybdenum steels.

Shortages of copper have plagued auto parts production sporadically and do not appear to be easing in the slightest. The suggestion that the government release 20 per cent of its 500,000 tons of stockpiled copper to relieve the present tightness appears to make sense, although it is not believed stockpiling authorities will act on it favorably with the world situation what it is.

At one time Buick and Plymouth were all set to change from aluminum to cast iron for pistons, had installed special equipment for casting and machining iron and then dropped the proposal as the aluminum supply held. Buick for a while was even casting 6000 iron pistons a day. It is not known whether they are still being held in stock or have been tossed back into the cupola. At any rate there still seems to be enough aluminum to cover piston requirements and the outlook presages an increasing amount of secondary metal as aircraft production expands. This metal is plenty good enough for pistons.

Power Braking Expands

Chrysler has shipped its 113,000th car equipped with power brakes. They are standard equipment on all New Yorker, Imperial and long-wheelbase Windsor models and will be standard on Saratoga models being introduced this month. They were first introduced as optional equipment in 1933 on Imperial models. Some type of power braking is a cinch to become available on other heavy models like Cadillac, Buick and Lincoln within the next two years. The ease which they bring to braking effort, particularly for women drivers, is a most attractive feature and it is strange that power systems have not appeared more widely before this on the heavier passenger cars. The same holds true for power steering, now also being pioneered by Chrysler.

Forty Years for Lamborn

Forty years of building cars and trucks were signalized for F. J. "Freddie" Lamborn of Dodge recently. He is known and liked by every production man around Detroit, plus hundreds of machinery and equipment specialists. He started with Dodge back in 1911 as a toolroom foreman and has had a very important finger in the building of an estimated 7,500,000 passenger cars and trucks, being hired by the late John and Horace Dodge three years before they built their first automobile. When Chrysler acquired Dodge in 1928, Lamborn was assistant production manager. He became operations manager, production manager in 1933, vice president in charge of manufacturing in 1936, and vice president and general manager in 1943. Many may recall how Lamborn teamed with other Dodge manufacturing men back during the first World War to prove to doubting foreign experts that recoil mechanisms for the 155-mm French type howitzer and 75-mm guns could be produced in volume by engineered automotive production methods.

Auto, Truck Output

U. S. and Canada

	1951	1950
January	645,688	609,878
February	658,918	505,593
March	802,737	610,680
April	680,281	585,705
May	695,898	732,161
June	653,673	897,853
Six Mos.	4,137,195	3,941,878
July		746,801
August		842,335
September		760,847
October		796,010
November		833,874
December		671,622

Week Ended	1951	1950
July 14	117,747	194,073
July 21	128,017	187,339
July 28	131,462	191,978
Aug. 4	116,924	175,572
Aug. 11	100,000*	182,965

Sources: Automobile Manufacturers Association, Ward's Automotive Reports. *Preliminary.

Auto Men Blast Tax Policy

Automotive tax levies under the present law bring an estimated $1425 million a year into the federal treasury while all other manufacturers' excises, applying to non-automotive items bring in only $310 million, a discrepancy which is being protested vigorously as "grossly discriminatory."

Automotive taxes have been increased steadily in recent years until they now take from 24 to 28 cents out of every automobile dollar and, in the case of gasoline, amount to about one third of the retail price. It appears questionable how much further this trend can go. Congressmen and senators historically have paid little heed to protests over automotive taxation. It is an easy kind of tax to enforce and the average car buyer has little knowledge of just how large the tax take is. In other words, it does not hurt him much, so the tax law writers continue to pour it on.

GM Adds Two Films

Two new sound motion pictures in full color have been added to the General Motors free circulating library of 48 films on assorted topics. One is "The Questing Mind," produced in the corporation's research laboratories and detailing activities there. The other, "Harnessed Lightning," was produced by Allison Division and shows how turbojet and turboprop engines work, tracing developments in these fields initiated by Allison engineers.

GM Tries Metal-to-Metal Sealing

"Metal to metal" block and head sealing arrangement has been worked out for General Motors diesel engines, replacing conventional cylinder head gaskets. To seal cylinder compression, a compressible metal ring is used between the top of each cylinder liner and the head. This ring effectively seals off the joint, permitting the maintenance of the 16.1 compression ratio of the engines. Water and oil passages are sealed with individual synthetic rubber rings which resemble hose washers. These fit into grooves machined in the block and are compressed tightly when the head is bolted in place.

Skilled Labor Tight in Detroit

Casual check of the classified pages of a Detroit newspaper one day last week showed over 60 advertisements for tool and die men—leaders, checkers, detailers, tryout and process specialists. This was not an unusual instance, simply pointing up the shortage of skilled help in the field. Companies looking for this type of personnel range from the top captive automotive tool and die shops all the way down to the "alley" tool shops of which Detroit has so many. A check with one of the larger outfits which for years has specialized in precision automotive die and tool work indicated operations there were about evenly divided between regular automotive jobs and requirements for defense production work, the latter of course increasing slowly as more military projects mature.

The Symbol of Quality

in

ELECTRIC FURNACE STEELS

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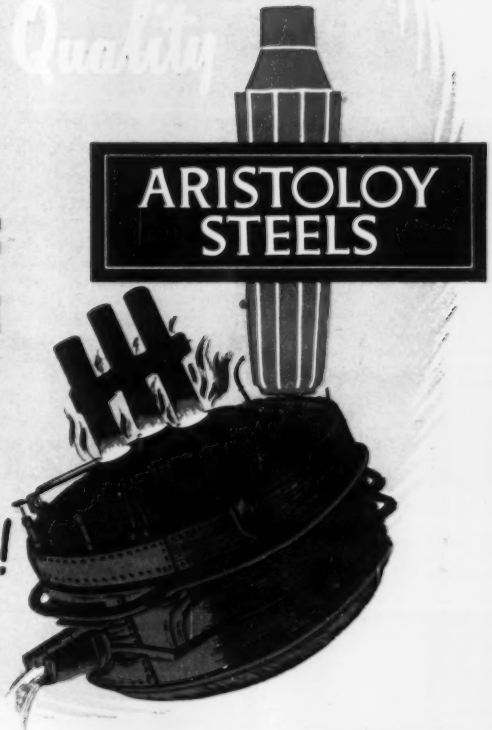

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TOUGH!—extreme hardenability, high tensile and fatigue strength, withstands 200,000 p.s.i. working pressures.

HARD!—can be oil-quenched in moderate sections to a maximum hardness of Rockwell C65/66.

EASY TO MACHINE!—excellent machinability because of fully spheroidized structure.

Ideal for parts like these:

1. Diesel injection pumps
2. Lathe centers
3. Slitting rolls and knives
4. Cam rollers for automotive steering gears
5. Machine tool parts
6. Pump parts
7. Aircraft engine parts
8. Mechanical seals
9. Saw mill rollers
10. Anti-friction bearings
11. Asbestos disintegrators
12. Mill rolls

—that's 52100 steel!

Here's a high carbon chromium steel that offers big advantages to manufacturers of machined parts requiring great strength and high resistance to wear. It's 52100 steel—originally developed by the Timken Company for anti-friction bearings.

Because it's hard and tough . . . and because of its excellent machining characteristics, 52100 is the ideal steel for a wide variety of applications. It has high fatigue strength and high tensile strength. When oil-quenched in moderate sections it has a maximum hardness of Rockwell C65/66. And it withstands a working pressure of 200,000 p.s.i. What's more, it's easy to machine—a result of spheroidized annealing.

The Timken Company—one of the world's largest producers of 52100—is the *only* source from which you can get *all three* finished forms of 52100 steel. Bars, tubes, and wire are available in a wide range of sizes. And for small run or emergency requirements, the Timken Company maintains a mill stock of 101 sizes in 52100 tubing—from 1" to 10½" O.D. Shipment is made within 24 hours after your order is received!

Most important, you can depend on uniformly high quality in every shipment of 52100 steel from the Timken Company. Quality is rigidly and completely controlled at every step in production—from melting to final inspection.

Write today for a stock list of available sizes, grades and finishes. And for detailed information on how 52100 steel can meet your particular need, consult our Technical Staff. Write The Timken Roller Bearing Company, Steel and Tube Division, Canton 6, Ohio. Cable address: "TIMROSCO".

YEARS AHEAD—THROUGH EXPERIENCE AND RESEARCH

Specialists in alloy steel—including hot rolled and cold finished alloy steel bars—a complete range of stainless, graphitic and standard tool analyses—and alloy and stainless seamless steel tubing

The Business Trend

Industrial activity index drops as July lull continues into August and restrictions on civilian hard goods cut into production

THAT JULY lull in business activity is continuing into August. It is caused by such seasonal factors as vacations, plus further restrictions on consumer hard goods manufacture. In each week of July, STEEL's activity index was well below the weekly average of the first half of 1951.

The decline continued in the week ended Aug. 4, with lowered auto assembly schedules dropping the index from 213 to 209 per cent of the 1936-1939 average. A year ago it was 212. Steelworks operations are several points higher than last year as is electric power output. Car loadings are about the same. If auto assemblies were being carried on at last year's rate the index would record 224, one point below the all-time peak.

The Federal Reserve Board blamed seasonal factors for causing its preliminary index of industrial production for July to drop to an estimated 215 per cent of the 1935-1939 average from the 223 mark of the previous two months. Improvement in auto production and soft goods industries is expected in the autumn.

Autos Hit 3.5 Million Mark . . .

The current lag in auto production was marked by a turnout in the week ended Aug. 4, of only 116,894 units from U. S. and Canadian assembly lines. This included the 3,500,000th unit to be built in the U. S. in 1951. Two fewer days were required last year to build that number, says *Ward's Automotive Reports*. But truck output runs well ahead of 1950, and barring an about-face in present scheduling, the 1,000,000th truck of 1951 will roll out late this month. August schedules call for 430,000 cars and 122,500 truck completions, nearly 50,000 autos and 9000 trucks better than July. August, however, has two additional work days.

Steel on Sustained Drive . . .

More and more steel for industry is pouring from the nation's busy mills, now adding every week to their long-sustained above-capacity operating drive. In the week ended Aug. 11, schedules called for production of 2,021,000 net tons of ingots and steel for castings, the American Iron & Steel Institute reported. This was a slight drop from the 2,029,000 tons poured the week before.

Freight Car Turnout Slashed . . .

Strikes in seven plants of four freight car builders and floods in the Middle West cut production to 5290 new domestic freight cars in July. June deliveries totaled 9644 cars and marked virtual attainment of the 10,000-car-per-month freight car construction objective set by government defense agencies. Backlog of orders on Aug. 1 numbered 144,810 cars, after orders for 2417 new freight cars were placed in July.

Electric Power Output Surges . . .

Electric power output continues its steady surge as installed capacity of utilities and industrial plants grows. The hot, dry last week of July caused output to exceed 7 billion kilowatt-hours for the third time in history.

BAROMETERS of BUSINESS

		LATEST PERIOD*	PRIOR WEEK	MONTH AGO	YEAR AGO
INDUSTRY	Steel Ingot Output (per cent of capacity)†	102.0	101.5	101.0	99.5
	Electric Power Distributed (million kilowatt hours)	7,003	7,005	6,077	6,247
	Bituminous Coal Production (daily av.—1000 tons)	1,704	1,712	1,753	1,786
	Petroleum Production (daily av.—1000 bbl)	6,175	6,205	6,169	5,640
	Construction Volume (ENR—Unit $1,000,000)	$267.6	$251.9	$404.7	$209.3
	Automobile and Truck Output (Ward's—number units)	116,894	131,598	98,087	175,572

*Dates on request. †Weekly capacities, net tons: 1951, 1,999,035; 1st half 1950, 1,906,268; 2nd half 1950, 1,928,721.

TRADE	Freight Car Loadings (unit—1000 cars)	825†	820	588	837
	Business Failures (Dun & Bradstreet, number)	171	184	129	168
	Currency in Circulation (in millions of dollars)‡	$27,842	$27,706	$27,948	$27,000
	Department Store Sales (changes from like wk. a yr. ago)‡	−21%	−23%	2%	+42%

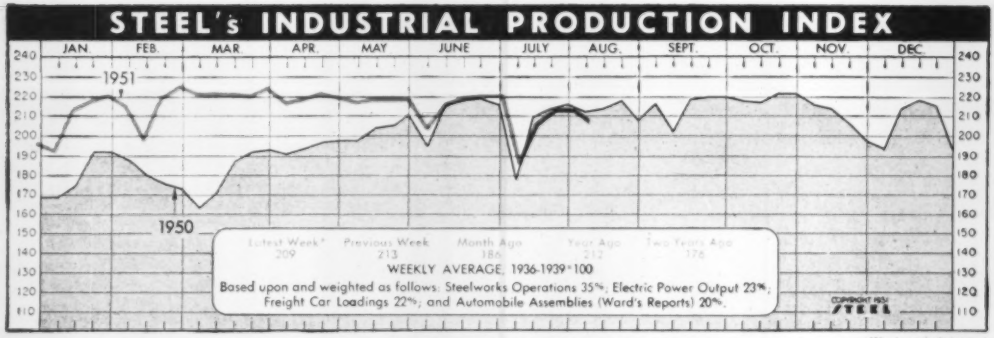
†Preliminary. ‡Federal Reserve Board.

FINANCE	Bank Clearings (Dun & Bradstreet—millions)	$14,608	$14,998	$14,738	$15,269
	Federal Gross Debt (billions)	$255.6	$255.3	$254.7	$257.6
	Bond Volume, NYSE (millions)	$11.3	$15.6	$10.2	$20.7
	Stocks Sales, NYSE (thousands of shares)	8,538	7,864	5,183	8,803
	Loans and Investments (billions)††	$70.1	$70.1	$70.6	$68.0
	United States Gov't. Obligations Held (millions)††	$30,949	$30,739	$31,176	$35,727

††Member banks, Federal Reserve System.

PRICES	STEEL's Weighted Finished Steel Price Index††	171.92	171.92	171.92	156.69
	STEEL's Nonferrous Metal Price Index‡	225.1	226.0	226.0	194.9
	All Commodities†	177.9	178.0	180.2	165.8
	Metals and Metal Products†	188.2	188.2	188.2	173.5

†Bureau of Labor Statistics Index, 1926–100. ‡1926-1929=100. ††1935-1939=100.


STEEL's INDUSTRIAL PRODUCTION INDEX
JAN. FEB. MAR. APR. MAY JUNE JULY AUG. SEPT. OCT. NOV. DEC.
1951
1950
Latest Week* 209
Previous Week 213
Month Ago 186
Year Ago 212
Two Years Ago 176
WEEKLY AVERAGE, 1936-1939=100
Based upon and weighted as follows: Steelworks Operations 35%; Electric Power Output 23%; Freight Car Loadings 22%; and Automobile Assemblies (Ward's Reports) 20%.
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*Week ended Aug. 4

In the year ended June 30, the Federal Power Commission reports production of energy by electric utilities passed the 350 billion kilowatt-hour mark for the first time, making a gain of nearly 16 per cent over the previous year. Combined utility and industrial production during June was nearly 35 billion kilowatt-hours, a jump of over 10 per cent from June, 1950.

Total installed capacity of generating plants in utility service on June 30 was 72,296,325 kilowatts, compared with 65,596,444 kilowatts a year earlier. Total industrial generating capacity was 13,919,415 kilowatts at the end of June.

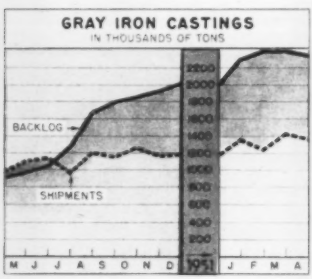
Plant Awards Top Field . . .

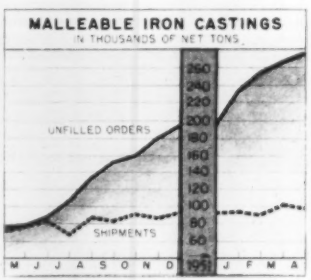
Heavy industrial building continues to dominate the construction field, says *Engineering News-Record*. With $82.6 billion in plant contracts awarded in the five days ended Aug. 2, plant awards are 271 per cent greater than for the same period last year. Private housing is 46 per cent below the 1950 volume so far. Total engineering contracts awarded in the week amounted to $267 million, slightly below the average week to date this year.

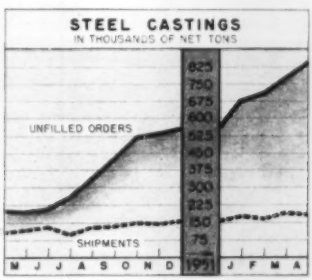
New construction valued at nearly $2.8 billion was put into place during July, 1951, the Department of Commerce reports. This was a 3 per cent boost over both the June, 1951, and the July, 1950, figures. Private homebuilding in July showed effects of restrictions and was about 30 per cent under last year's record rate.

Coal Piles High . . .

The upward climb in coal stocks continues. On July 1 they amounted to 76,992,000 net tons, the greatest amount of soft coal on hand since June 1, 1943, says the Bureau of Mines. At current rates of consumption, there was sufficient coal on hand July 1 to last 70 days. Electric utility power plants were well







Gray Iron Castings

Thousands of Net Tons

	Shipments		Backlogs*	
	1951	1950	1951	1950
Jan.	1,304	913	2,298	914
Feb.	1,234	864	2,362	873
Mar.	1,110	906	2,340	922
Apr.	1,363	981	2,337	922
May		1,065		978
June		1,136		1,040
July		961		1,287
Aug.		1,202		1,670
Sept.		1,159		1,794
Oct.		1,255		1,840
Nov.		1,161		1,930
Dec.		1,182		2,012
Total		12,905		

*For sale, U. S. Bureau of the Census

Malleable Iron Castings

Thousands of Net Tons

	Shipments		Unfilled Orders*	
	1951	1950	1951	1950
Jan.	92.5	62.9	234	62
Feb.	89.9	60.4	255	67
Mar.	101.7	66.3	267	70
Apr.	97.3	69.8	276	76
May		76.2		77
June		82.3		87
July		67.5		105
Aug.		86.0		132
Sept.		82.5		153
Oct.		90.0		160
Nov.		85.2		180
Dec.		91.3		195
Total		920.6		

*For sale, U. S. Bureau of the Census

Steel Castings

Thousands of Net Tons

	Shipments		Unfilled Orders*	
	1951	1950	1951	1950
Jan.	174.1	89.1	675.4	142.5
Feb.	164.0	91.8	707.4	165.2
Mar.	190.7	111.8	779.7	185.6
Apr.	182.2	107.0	846.9	201.6
May		117.9		198.0
June		131.1		206.8
July		98.3		255.4
Aug.		128.4		239.9
Sept.		134.6		428.0
Oct.		149.6		521.8
Nov.		145.9		537.7
Dec.		155.3		554.2

*For sale, U. S. Bureau of the Census.

Charts—Copyright 1951, STEEL

stocked, having 134 days' supply. Consumption in June totaled 33,004,000 net tons; industrial consumption required nearly 30 million tons of this and retail dealer deliveries took the rest. On a weekly basis, the period ended July 28 saw 10,225,000 net tons of soft coal mined.

Prices Ease Again . . .

Wholesale prices for the ninth successive week slipped down in the week ended July 31. Average primary market prices, at 177.9 per cent of the 1926 average, were still 13.4 per cent above the May 24-June 25, 1950, average and 7.3 per cent above the level of a year ago.

Inventories Creep Higher . . .

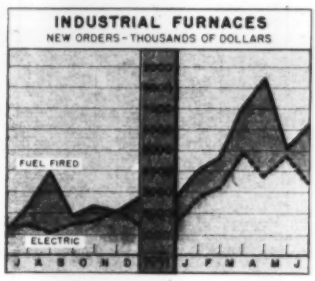
Business inventories are still on the upswing. At the end of June they reached $69.3 billion, the Office of Business Economics estimated. After allowance for seasonal variation, total book value of inventories in manufacturing and trade increased $550 million during June. Manufacturers stocks rose $900 million, while dips in retailers' and wholesalers' stocks exceeded $200 million and $100 million, respectively. Manufacturing stocks accounted for $39.8 billion, of which $18.9 billion were durables and $20.9 billion nondurables. Business sales on a seasonably adjusted basis dropped from $45.5 billion in May to $44.2 billion in June.

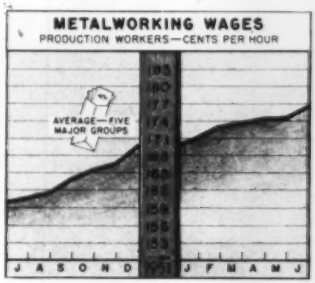
Trends Fore and Aft . . .

Apex Electrical Mfg. Co., with a net loss of nearly $100,000 in the second quarter, has taken on about $15 million in military orders . . . Mechanical stoker sales in 1951's first half amounted to 9302 units, a 44 per cent gain over 1950's first half. . . . More than 200 million receiving tubes were sold in the first six months of 1951, 45 million more than the corresponding period of 1950. . . . June was the tenth consecutive month to show fewer new business incorporations than for the comparable month of the year before . . . American Brake Shoe Co.'s first-half sales were highest in the company's history.

Issue Dates of other FACTS and FIGURES Published by STEEL:

Construction	July30	Gear Sales	Aug.6	Ranges, Elec.	July30
Durable Goods	Aug.6	Indus. Production	July23	Ranges, Gas	July30
Employ., Metalwk.	July16	Ironers	July16	Refrigerators	Aug.6
Employ., Steel	July23	Machine Tools	Aug.6	Steel Forgings	July2
Fab. Struc. Steel	July30	Prices	July23	Steel Shipments	July2
Foundry Equip.	July16	Pumps, New Orders	July9	Vacuum Cleaners	Aug.6
Freight Cars	July23	Purchasing Power	July23	Washers	July16
Furnaces, W. Air	July30	Radio, TV	July16	Water Heaters	June25





Industrial Furnaces
New Orders—Thousands of Dollars

	Fuel Fired*		Electric	
	1951	1950	1951	1950
Jan.	4,033	1,914	2,764	473
Feb.	4,670	616	3,212	697
Mar.	7,019	1,300	4,846	753
Apr.	8,497	837	3,657	415
May	5,044	1,392	4,766	982
June	6,259	1,166	3,370	1,328
July	....	2,247	....	1,445
Aug.	....	3,927	....	1,039
Sept.	....	1,817	....	1,485
Oct.	....	2,306	....	1,603
Nov.	....	2,068	....	2,157
Dec.	....	2,749	....	1,505

* Except for hot rolling steel.
Industrial Furnace Mfrs. Assn.

Metalworking Hourly Wages
(cents)

Production Workers—Five Major Groups

1950	Prim. Mtls.	Fab. Prod.	Mach- inery	Elec. Mchy.	Trans. Equip.
June	163.0	151.5	158.3	145.1	172.7
July	164.5	152.2	159.5	146.4	172.8
Aug.	163.9	153.9	160.7	146.7	173.5
Sept.	166.9	156.1	162.6	148.5	177.0
Oct.	166.6	157.6	165.5	152.3	178.1
Nov.	167.8	158.0	167.5	153.9	179.0
Dec.	173.8	161.0	169.8	155.5	181.6
1951					
Jan.	178.9	162.2	171.6	155.6	180.6
Feb.	177.9	163.5	172.6	156.9	181.5
Mar.	179.7	165.2	174.5	158.2	183.8
Apr.	180.7	165.6	174.8	159.3	182.6
May	180.5	165.6	175.1	159.8	182.6
June	182.8	166.5	176.9	163.4	184.9

U. S. Bureau of Labor Statistics.

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Quick answers on "in stock" availabilities of spring steel (annealed or tempered) are assured at Kenilworth. At this pictured pentagon desk current inventory records make possible immediate response to your inquiries, by phone, wire or letter. Kenilworth's specialized spring steel department is well stocked with a wide variety of types, sizes and finishes — ready to meet your exacting specifications in shipment after shipment regardless of size of order. Try us today.

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to give you samples before blueprints

Every new SPEED NUT design is worked out on manual presses to provide samples for testing and approval BEFORE blueprints of the part are drafted

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A design-in-metal is created with only a rough draft as a guide. Dies that pierce, bend, trim are selected from thousands like those illustrated below. These are set up in a series of manually operated presses to shape bits of metal into fasteners engineered for specific fastening functions. The samples produced are accurate prototypes of the finished fasteners, and can be used for mock-up assemblies.

These parts are then tested and approved by the customer before blueprints are drafted and the part is put into production.

In times like these, high-geared fastener engineering saves valuable production hours and profit dollars. Proof of Tinnerman's ability to serve you is outlined in a new 20-page booklet, "A Story of Quality". Write for your copy. TINNERMAN PRODUCTS, INC., Dept. 12, Box 6688, Cleveland 1, O.

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Men of Industry

L. L. GARBER
. . . gen. mgr. at Hinderliter Tool

L. L. Garber, vice president, **H. K. Porter Co. Inc.,** was appointed general manager of its Hinderliter Tool Co. Division, Tulsa, Okla., producer of oil field well head equipment and lubricated plug valves. He is succeeded as general manager of American-Fort Pitt Spring Division, manufacturer of railroad and industrial springs, by **H. A. Harrington,** former works manager. Before joining Porter Mr. Garber was successively production manager, Pittsburgh Screw & Bolt Corp.; assistant plant manager, Curtiss Propeller Division, Curtiss-Wright Corp.; and vice president, Tracy Mfg. Co. Mr. Harrington was formerly vice president, Goods Road Machinery Co.

J. L. Singleton, vice president in charge of the general machinery division, and **R. S. Stevenson,** vice president in charge of the tractor division, **Allis-Chalmers Mfg. Co.,** Milwaukee, were named to the board of directors. They fill vacancies created with the deaths of **Walter Geist,** president, and **W. C. Johnson,** executive vice president. **W. E. Hawkinson,** secretary-treasurer, was named vice president and secretary-treasurer.

A. G. Bowe was elected president of **James H. Rhodes & Co.,** Chicago, to succeed the late **Elmer R. Murphey.** Mr. Bowe was executive vice president. **William Galbally Jr.,** was elected secretary and treasurer.

Executive appointments in the sales department of **Granite City Steel Co.,** Granite City, Ill., include: **Fred L. Rupp,** product sales manager for Strongbarn roofing and siding; **John P. Stoll Jr.,** to succeed Mr. Rupp as manager, Dallas office; and **John A. Leschen,** assistant to the vice president in charge of sales.

S. D. Flinn was elected director and secretary of **United States Steel Supply Co.,** Chicago, subsidiary, U. S. Steel Corp. His appointment as comptroller was announced in June. **Howard C. Swain** was appointed assistant district manager, Pittsburgh.

Benjamin Electric Mfg. Co., Des Plaines, Ill., elected **R. Allen Benjamin** as vice president and secretary. **Arthur E. Swendenborg** was named assistant general sales manager. **Ivar H. Stockel** succeeds Mr. Swendenborg as central division sales manager at Chicago. Other appointments include **Frank A. Callahan** as manager, advertising department, and **James R. Chambers** as manager of the sales promotion division.

V. de P. Gerbereux was appointed manager, centrifugal pump sales division, **Worthington Pump & Machinery Corp.,** Harrison, N. J. He succeeds **A. H. Borchardt,** recently elected vice president in charge of centrifugal, reciprocating and vertical turbine pump sales.

Rudolph Illing was promoted to assistant traffic manager of **Columbia Steel Co.,** San Francisco, subsidiary, U. S. Steel Corp. He succeeds **F. E. McClure,** retiring after 33 years with U. S. Steel subsidiaries. Mr. Illing, associated with U. S. Steel since 1912, through his promotion becomes chief aide to **H. M. Daschbach,** general traffic manager.

William W. Wellborn was appointed research engineer of carbide research and development department, **Firth Sterling Steel & Carbide Corp.,** Pittsburgh. He has been associated for the the last five years with Los Alamos, AEC, Scientific Laboratories, University of California, where he designed and equipped the present powder metallurgical laboratories.

George Breza was appointed chief engineer of **Mackintosh-Hemphill Co.,** Pittsburgh. He was assistant chief engineer since 1937.

Richard P. Carroll was named production control manager for **Hunt-Spiller Mfg. Corp.,** Boston. He remains in charge of cost and materials control.

Caine Steel Co., St. Louis, has opened a new office in Kansas City, Mo., under the direction of **Jack R. Parmenter** as western sales representative. **H. Milton Gehlert** was appointed sales representative to handle St. Louis county and Arkansas customers, succeeding Mr. Parmenter.

Dollin Corp., Irvington, N. J., producer of zinc and aluminum die castings, appointed **Edward A. Linhart** as its representative for the Pittsburgh area. He was formerly associated with Aluminum Co. of America, Elastic Stop Nut Corp., and most recently with Follansbee Steel Corp. in Pittsburgh.

Baldwin - Lima - Hamilton Corp., Philadelphia, appointed **L. J. Griffiths** assistant controller.

John Gilbert was elected executive vice president of **Ashdee Products Inc.,** Homewood, Ill., manufacturer of Paint-Miser electronic paint spray

WILLIAM W. WELLBORN
. . . Firth research & development engineer

JOHN GILBERT
. . . exec. V. P. of Ashdee Products

equipment. He will be in complete charge of all activities of the company.

N. W. Bass, who joined **Brush Beryllium Co.,** Cleveland, in 1945 as sales manager and was later made assistant vice president, was promoted to vice president.

Hercules Powder Co., Wilmington, Del., appointed **J. Joseph Kelleher** as an assistant director of sales of the explosives department.

Frank Thornton Jr., engineering manager of association activities for **Westinghouse Electric Corp.,** Pittsburgh, is retiring after 42 years' service. He has served in his present capacity since 1931 and holds nearly 50 engineering patents.

National Flexible Packaging Association appointed **John M. Cowan** managing director. After Sept. 1 he will be located in Cleveland.

W. E. Guy was appointed Chicago district manager, **Graybar Electric Co.,** New York, succeeding **G. J. Cossmann** who retired after more than 51 years of service.

D. G. Holt was appointed assistant superintendent, mechanical maintenance department, **Crucible Steel Co. of America,** New York. He was associated with Corporacion de Fomento de la Production in Chile.

American Cyanamid Co., New York, promoted **Herbert G. Pratt** to manager of the San Francisco office of industrial chemicals division. **Sheldon T. Dahl** was named West Coast manager, industrial chemicals division and plastics and resins division.

Bradley Bartlett was appointed chief engineer of **Kling Bros. Engineering Works,** Chicago. Prior to affiliating with the company some months ago, he had a number of years' experience in engineering phases of metalworking.

Donald M. McGrath was appointed general manager, Utica, N. Y., division, **Bendix Aviation Corp.** Associated with the firm since 1934, he was appointed manager of the Red Bank, N. J., division plant last December.

R. A. Lees was named general plant manager, **Automotive Rubber Co. Inc.,** Detroit. He has complete responsibility for operations of the company's new rubber mill and all processing departments.

A. BOYD CORRELL
. . . V. P. sales, Bardwell & McAlister

A. Boyd Correll was elected vice president in charge of sales, **Bardwell & Alister Inc.,** Burbank, Calif. As assistant to the president, Mr. Correll is primarily responsible for development of company business, and continues in that capacity.

Robert Price was appointed sales manager, plastic products division, **B. F. Goodrich Co.,** with headquarters in Marietta, O.

Appointments in the Supertex furnace division, **Perfection Stove Co.,** Cleveland, include: **A. B. MacLaren,** named sales manager of the division; **E. B. Goodwin,** accounts manager; **E. W. Conners,** furnace service manager.

Andrew J. McCoy was named assistant to **D. W. Watters,** production manager, magnesium wrought products, **Dow Chemical Co.,** Midland, Mich.

Ira G. Needles, vice president, **B. F. Goodrich Rubber Co.** of Canada Ltd., Kitchener, Ont., since 1945, was elected company president. He succeeds **George W. Sawin,** president since 1941, who resigned for reasons of health. Mr. Needles joined B. F. Goodrich Co., Akron, in 1916 and in 1925 became a member of its Canadian subsidiary.

IRA G. NEEDLES
. . . heads B. F. Goodrich of Canada

Robert K. Baxter, general manager, **Advance Spring Corp.,** Chicago, was elected a vice president.

Latrobe Electric Steel Co., Latrobe, Pa., appointed **W. G. Dahl** as district manager of its Hartford, Conn., territory, replacing **H. C. Cole,** resigned.

Watson-Stillman Co., Roselle, N. J., appointed **H. L. Henry** as divisional sales representative of northern Ohio, with headquarters in Akron.

Robert D. Turner was appointed secretary-treasurer of **Marvel-Schebler Products Division** of Borg-Warner Corp. at Decatur, Ill. He was assistant to the treasurer of Borg-Warner's Pesco Products Division at Bedford, O. In his new post he succeeds **Walter E. Walpole,** resigned. **Donald N. Arndt** was appointed general sales manager at Marvel-Schebler.

E. K. Redfern was elected treasurer and director of **Eichleay Corp.,** Pittsburgh.

Wel-Met Co., Kent, O., manufacturer of self-lubricating bearings and structural parts made of metal, appointed **Don S. Urquhart** product engineer. For the last 16 years he served in a similar capacity for U. S. Graphite Co.

Harold J. Thompson was appointed manager of consumer products sales for **International Nickel Co.'s** nickel alloy sales department, New York. He has been engaged in sales work for International Nickel and associated companies since 1936.

James MacGregor was elected president of **York Engineering & Construction Co.,** Pittsburgh. Other officers of the company, a former partnership newly incorporated, are: **Charles MacGregor,** vice president; **Philip M. Weber,** treasurer; and **J. Donald Cook,** secretary. All officers are directors.

James C. Barney was appointed assistant manager of sales for the wire rope division of **John A. Roebling's Sons Co.,** Trenton, N. J. He replaces the late **George B. Stoess.** Mr. Barney has been with Roebling for the last 26 years. Since 1947 he has been assistant manager of the Los Angeles

TRANSUE FORGINGS

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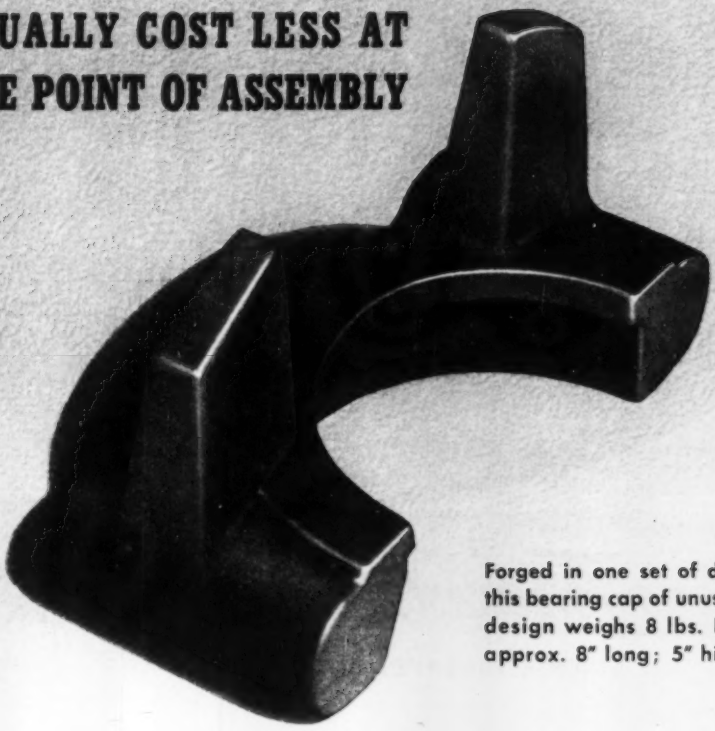

Forged in one set of dies, this bearing cap of unusual design weighs 8 lbs. It is approx. 8" long; 5" high.

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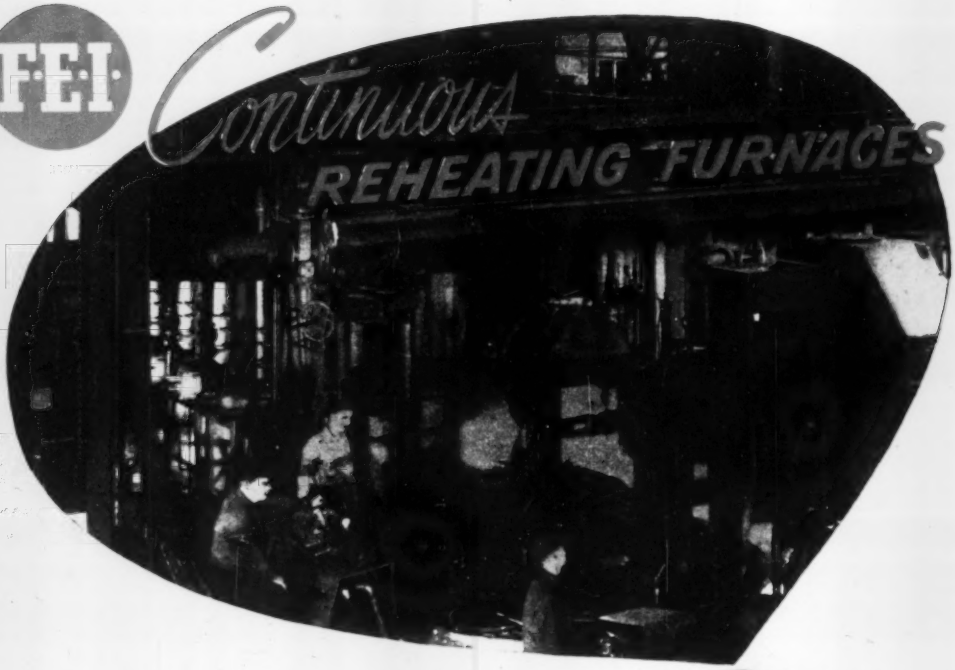

Breaking Tonnage Records on SLABS, BILLETS, BLOOMS

Leading steel mills are going modern to the "nth" degree in order to meet today's demand for greater tonnage! Reports from users of F.E.I.'s modern Continuous Reheating Furnaces indicate consistently better results, *setting new records for tonnage*. All F.E.I. furnace installations are complete and co-ordinated. Patented automatically controlled combustion system guarantees the last word in *performance!*

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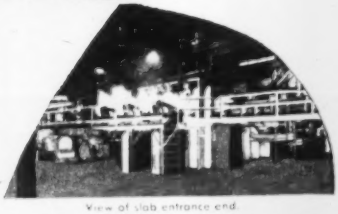
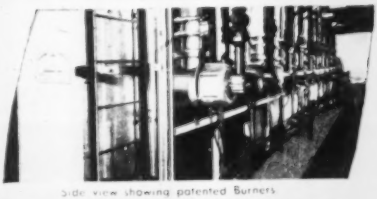
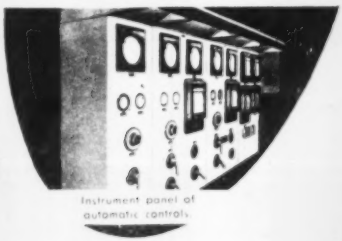


View of slab entrance end.



Side view showing patented Burners



Instrument panel of automatic controls

Furnace Engineers, Inc.

F.E.I. BUILDING • 1551 W. LIBERTY AVE. • PITTSBURGH 16, PA.

AFFILIATES — Great Britain, Salem Engineering Co., Ltd., Millard near Derby, England. France, Belgium, Holland, Luxembourg and Italy, Heurtey & Co., 38 Av. G. Mandel, Paris XVI, France.

3

district office and sales representative to California oil field accounts.

Stewart W. Varn was appointed assistant to the vice president of **Inland Steel Container Co.**, Chicago. Formerly sales manager of the pigment division of Metals Disintegrating Co., Mr. Varn will be in charge of co-ordinating all sales activities of the container company.

Weldon Draper was appointed company salesman by **Ziegler Steel Service Co.**, sheet and strip distributor, Los Angeles, to serve East Los Angeles, Pasadena, Alhambra and the San Gabriel Valley. **Le Roy Morris** was appointed sales representative, Albuquerque, N. Mex., to serve New Mexico.

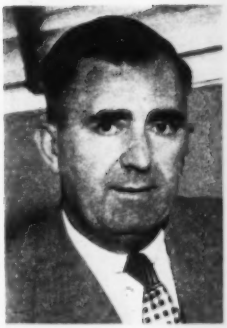
National Sprayer & Duster Association, Chicago, elected **R. B. Chapin** president and also chairman of the executive board. Mr. Chapin is president of R. E. Chapin Mfg. Works, Batavia, N. Y. He succeeds **C. D. Leiter**, sales manager of F. E. Myers & Bros. Co., Ashland, O. **H. F. Brandt**, president, Dobbins Mfg. Co., Elkhart, Ind., was elected vice president of the association and vice chairman of the executive board.

Frank Farnan was named advertising manager, **A. M. Byers Co.**, Pittsburgh.

John L. Hutton was appointed northeastern Ohio representative for **Dunsford Co.**, Pittsburgh.

Walter H. Creber Jr. was appointed sales manager of **Chicago Steel Service Co.**, Chicago.

James G. Kellogg has resigned as chairman and director of **Kellogg Switchboard & Supply Co.**, Chicago, after more than 40 years as an executive of the company.



THOMAS W. CURTIN
directs purchases, Yale & Towne div.

Thomas W. Curtin was appointed director of purchases, Philadelphia division, **Yale & Towne Mfg. Co.** He succeeds **W. B. Crossland**, resigned. Mr. Curtin was assistant director of purchases. He went to Philadelphia in 1946 from the Stamford, Conn., division of Yale & Towne where he was assistant purchasing agent.

Raymond H. Armour was appointed to the newly created post of operating priorities representative in **American Steel & Wire Co.'s** production planning department, Cleveland.

Robert N. Merk, formerly with H. H. Robertson Co., Ambridge, Pa., was named chief engineer of **Sharon Steel Corp.**, Sharon, Pa.

Von D. Polhemus was appointed engineer in charge of the engineering staff structure and suspension development group, now located at the new **General Motors Corp.** technical center, Detroit.

Luria Steel & Trading Corp., New York, appointed **William K. McLellan** as district manager of its Detroit office, and **Jack Hopkins** as assistant district manager.

GEORGE H. GOECKE
Industrial Ovens sales engineer

George H. Goecke was appointed sales engineer for **Industrial Ovens Inc.**, and will use the Cleveland headquarters of the company as his base of operations. For the last year Mr. Goecke was a manufacturer's representative in northern Ohio and western Pennylvania for Warren Steam Pump Co., Warren, Mass.

Harold O. Flynn was named chief aviation engineer, **Chevrolet Aviation Engine Division**, General Motors Corp., Detroit. His headquarters will be the Chevrolet division at Tonawanda, N. Y. Mr. Flynn succeeds **C. W. Frederick.**

W. E. Madden, formerly vice president, George Haiss Mfg. Co. Inc., New York, was appointed to a new post of director of sales of those Pettibone Mulliken companies whose products are sold to construction, road building, processing, and materials handling fields. **J. M. Hume**, formerly sales manager, Universal Engineering Corp., Cedar Rapids, Iowa, was made assistant director-sales. Both will have headquarters in Chicago.

OBITUARIES...

Roy J. Wadd, 61, consulting engineer for **Harnischfeger Corp.**, Milwaukee, until retirement three years ago, died Aug. 4. He joined the company in 1927 as chief engineer of the crane division, and was later made chief executive engineer.

Southard Hay, 75, partner in **Bristol Metal Products Co.**, Pittsburgh, died July 31. He had been affiliated with Harbison-Walker Co., Standard Construction Co., and later was president of Cuthbert Bros Co.

Edward B. Harkness, 76, retired **U. S. Steel** subsidiaries executive in Chicago, died July 25. When he retired in 1940 he was affiliated with Carnegie-Illinois Steel Corp.

Guy B. Entrekin Sr., 63, chief chemist for **Claymont Steel Corp.**, Claymont, Del., died July 25.

Peter Mate, 68, former superintendent, **Greenlee Foundry Co.**, Chicago, from 1926 to 1944, died July 22. He retired seven years ago.

Omar B. Whitaker, 61, manager of marine sales for **Sperry Gyroscope Co.**, Great Neck, N. Y., died Aug. 1.

LaMotte Henry, formerly associated with **Lake City Malleable Co.**, died Aug. 2. He handled sales work in northwestern Ohio and Toledo. He had previously been affiliated with Buhl Malleable Co.

Creative METAL STAMPINGS

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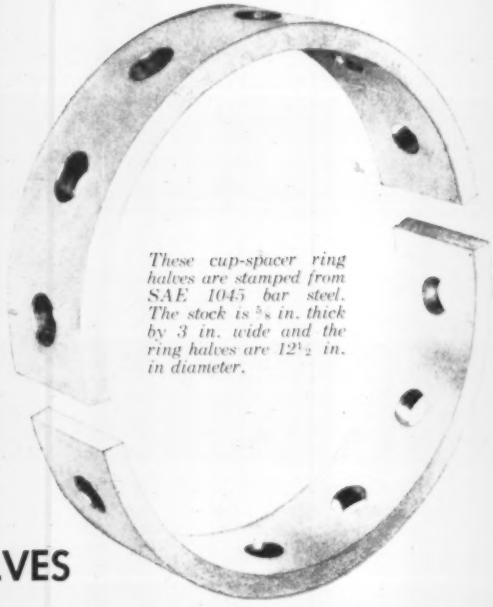
CLEAN, SCALE-FREE
METAL SURFACES
...CLOSE TOLERANCES
in these

TIMKEN
TRADE-MARK REG. U. S. PAT. OFF.
TAPERED ROLLER BEARINGS

CUP-SPACER RING HALVES



These cup-spacer ring halves are stamped from SAE 1045 bar steel. The stock is $\frac{5}{8}$ in. thick by 3 in. wide and the ring halves are 12½ in. in diameter.

Before these 10 pound cup spacer ring halves, used in railroad equipment, were converted to LEAKE stampings from the hot forming method, it was difficult to obtain the necessary close tolerances and a smooth, clean metal surface. The LEAKE Organization is meeting these specifications with minimum operations, i.e., cut-to-length, piercing, cold forming and stenciling. Sufficient pressure in forming overcomes springback in these $\frac{5}{8}$ inch thick metal stampings. The increased rate of production by this cold forming method results in an overall saving of cost.

This is *one* more example of the many ways the LEAKE Organization serves industries such as railroad, petroleum, agriculture, appliance, and automotive. In addition to the forming of small and large parts, other available services include Annealing, Carburizing, Hardening, Cleaning, Testing, Prime Coating, and all types of Welding. In fact, the LEAKE Organization and facilities together form a "complete package" service.

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Send us a blue print or drawing of your part. We'll be frank in telling you if stampings offer you no advantage over your present method of production but if they do, we would like to show you how we can help you.

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THE LEAKE STAMPING COMPANY • MONROE, MICHIGAN

Production AND Engineering NEWS AT A GLANCE

LOCKING HEAD IS UPSET—New type of self-locking bolt, from the prolific brain of Charles W. Place, has three equispaced slots across the top of the head, with a narrow annular relief under the head and next to the shank. The entire head is formed in two operations on an upsetter. As the bolt is drawn up, the bearing area on the underside of the head is that portion outside the annular relief. Upward pressure slightly displaces the six pie-shaped segments on the top of the head as the locking action is established. The design is already in production and has found some automotive applications.

DIE CAST NOSES—Casting fuze noses for 20-mm shells at a rate of 2700 an hour is easy for a 12-cavity zinc die casting machine of the plunger type. Gates and flash metal are trimmed off in punch presses and reused. Every hour a gate of 12 castings is pulled out for dimensional checks on eight go and no-go gages. —p. 78

EFFECTIVE DESCALING—Forging scale literally "blasts" off the surfaces of forgings treated in a new type of chemical bath made up of a compound called SR-4 in a weak muriatic acid solution. Parts are dipped in the solution for 5 minutes and then either placed directly in heat treating furnaces or stored for heat treat. Water quenching from heat treating temperatures results in perfectly clean parts, ready for subsequent machining. Satisfactory results have been realized with plain carbon steels and some alloys. —p. 80

CERAMICS AID METALS—Research on ceramic coatings for steel in high-temperature applications has been intensified in recent years at industrial plants, university laboratories and the National Bureau of Standards. While the turbojet engine field is the most obvious outlet for ceramic-coated parts, there are many others such as furnace flues, exhaust pipes and mufflers, space heaters, heat exchangers and annealing covers. Coatings for protection of alloy steel have as their basis enamel frits which mature at temperatures in the 1800-1900 F range, well above the range for commercial frits. —p. 74

ALUMINUM MELTING—Adapted to permanent mold or die casting of aluminum is a new two-chamber gas fired melting furnace featuring a rectangular shaped iron melting pot coated with ceramic and separated into two compartments by means of a ceramic coated baffle which extends to about 1 inch from the bottom to permit molten metal to pass from the charging to the pouring chamber. The baffle can be adjusted to divide the chambers into any desired proportion. The furnace is fired by multiple blast burners from one side only, and has two flues, one located at each end of the burner side. The unit is designed to provide the advantages of a two-chamber induction furnace, minus the hot metal agitation.

BETTER SERVICE FROM ROLLS—Roll spalling has been just about eliminated by limiting total cold reduction to 90 per cent before annealing and by using smaller reductions per pass—the reason for going from four to five stands in tandem mills. Roll manufacturers also have helped by working out the proper compromise in rolls between hardness and ductility. Finishing stands should have hardness of around 95 scleroscope. —p. 88

ISOTOPE TRACES WEAR—To measure tire wear quickly under varying conditions of operation, a rubber manufacturer mixes radioactive phosphorus with the top layer of the tread material, then mounts a portable Geiger counter in a small cart to scan the track made by the radioactive tire, giving an indication of the amount and size of particles worn off the tread. Supplementing this equipment are X-rays of the "hot" tire tracks and an air scoop behind the tire to feed particles blown off the tire into a vacuum cleaner hose for capture and measurement.

TESTS HOT HARDNESS—Microhardness tester for measuring the hardness of electrodeposits has been developed by the National Bureau of Standards. It is based on the diamond-indentation method; however, because of the thinness of electroplated coatings and their softness at temperature, the device has been specially designed to make indentations of microscopic depth under low loads. Specimens are heated under pressure in inert gas. The instrument may have important application in studies of properties of new types of high-temperature alloys used in the "hot" sections of jet engines.

THE AUTOBODY LIGHT—Four large companies recently undertook joint research on the aluminum automobile body which in recent years has had little active consideration from a low-cost quantity production standpoint. An experimental body of aluminum alloy sheet was mounted on a current production chassis (Willys) and a performance check made. An 11 per cent weight reduction was realized, no serious difficulties were encountered in forming and processing, and the general conclusion was reached that "aluminum alloy sheet must definitely be considered a well-suited material for quantity production of auto bodies." —A.H.A.

Metalworking Outlook—p. 37 *Market Outlook—p. 139*

Heat-Resistant Ceramic

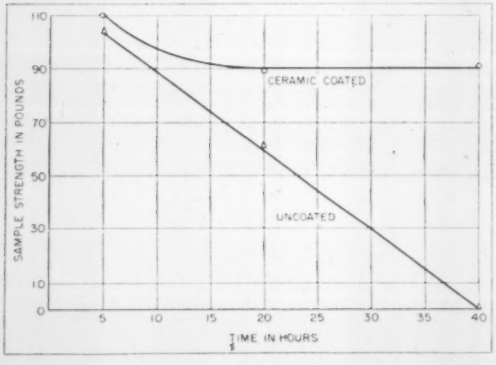
Broaden Low

Various types have been developed for use in a wide range of temperatures. Preparation of base metal is an important consideration, with sandblasting appearing the best method for most surfaces. Thicknesses of coating are in the range of 0.002-0.004-inch

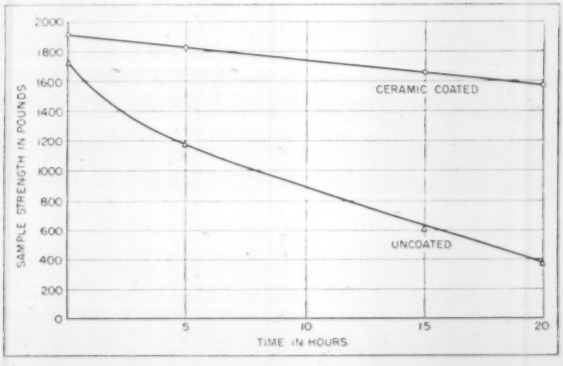
Above—High temperature ceramic coatings are increasing the life span of exhaust manifold systems built by Ryan Aeronautical Co. They protect "header" sections from the great heat of gases in new piston engines

Left—This low carbon steel cylinder was coated with refractory ceramic on the inside only. It was subjected to a temperature of 1500 F for 50 hours. The metal failed, but failure progressed from the outside only. The coating continued to adhere and to protect the inner surface

Effect of extended heating at 2000 F on the sample strength of 18-8 stainless type 347 broken at 2000 F



Effect of extended heating at 1700 F on sample strength of 1020 low carbon steel



Coatings

Carbon Steel Applications

HEAT-RESISTANT ceramic coatings on steel are enabling many manufacturers to get increased efficiency in their products and are helping to save hard-to-get critical metals. Experimental evidence indicates that the use of properly selected enamel coatings will often permit high temperature use of relatively noncritical iron and low carbon steel.

Even in the case of many alloy metals, properly applied ceramic coatings will result in beneficial effects: (1) Increase fatigue strength and fatigue life; (2) prolong usefulness at specified operating temperatures; (3) permit their use at even higher temperatures for considerable periods of time.

Retards Corrosion—High temperature ceramic coatings are used in all installations where heat is accelerating the corrosion of any metal. Specific applications include space heaters, smoke pipes, superheated steam pipes, heat exchangers and annealing covers as used in heat treating metal. A fertile field for coatings of this type is in systems in contact with exhaust gases from combustion processes; for example, furnace flues and exhaust pipes and mufflers of internal combustion engines. In many cases a coated steel section may replace one made of a scarce metal or replace a thicker section and thereby effect economies of construction as well as insure improved performance. Heat-resistant porcelain enamel is being used by furnace manufacturers on heat exchangers to repel corrosive gases and give a high rate of heat emissivity or heat release. Parts so coated are permanently free from scale and corrosion. Basically the coating is the same durable, high thermal shock-resistant coating that was used in World War II on exhaust systems for amphibious jeeps, tanks and airplanes.

Some specific ceramic coating applications suggested for consideration in the defense program are: Exhaust stacks or collector rings, tail pipes, tail cones, flame tubes, turbine buckets and to insulate foil blankets. Work has been conducted by the National Bureau of Standards to develop ceramic coatings that would resist the heat generated by aircraft exhaust system parts. The term "ceramic coating" is generally used to distinguish these more refractory special-purpose enamels from the conventional porcelain enamels.

Used on Many Surfaces — A high-temperature enamel coating, made by Ferro Enamel Corp., Cleveland, is usable on many surfaces heretofore unsuited for ceramic coatings. According to Ferro Enamel engineers, the coating has a wide firing range. It is applied in fired down thicknesses of 0.002-0.0025-inch. Even a strong blow or bending does not ruin the protective value of the enamel, though some surface enamel is lost. The adherence and deep bonding ability are outstanding features of the coating.

Constituent parts of the high temperature L625-2056 coating are: L625 and 2056 frits, calcined alumina, black label clay, red label clay, borax oxide, citric acid and water. The specific gravity of the slip should be 1.57-1.60 at a fineness of 4-5 grams through a 200-mesh screen with a 50 cc sample water washed. The new temperature-resistant enamel is applied in an identical procedure to porcelain enamel.

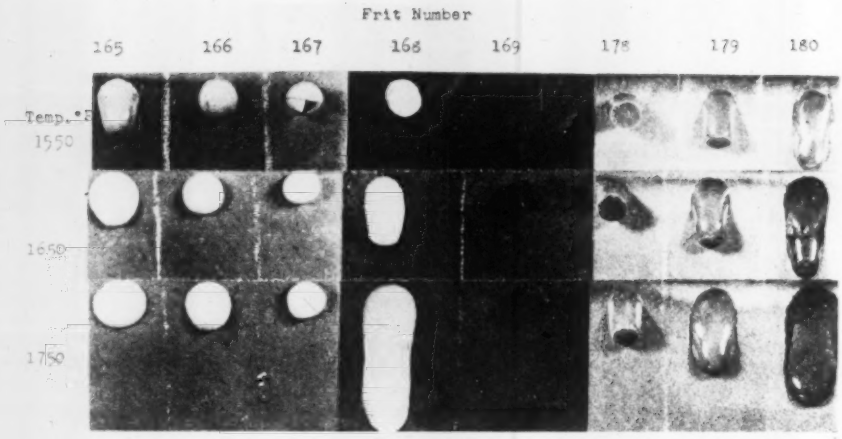
The company reports that the coating is well suited for mass automotive use; for wider use in the aircraft industry and in other applications where utility and durability under extreme conditions of weather, gas erosion and/or heat are a problem. It may be the answer to intergranular corrosion of metal as it occurs in turbo superchargers used in jet and conventional engines. Some applications on short exhaust stacks for aircraft, certain marine and diesel mufflers, and a large number of exhaust systems on amphibious ducks and jeeps have been made. Ceramic coated mufflers and exhaust pipes are possibilities for the truck, bus or automobile manufacturer.

Testing of the coating for use with military jet, rocket and conventional aircraft is also underway. As a result tail cones for the J-37 engine promise longer life without the use of strategic metals. Ceramic coatings have been applied to heat exchangers in the Air Force B36 bomber. Built of Inconel, heat exchanger parts operate de-icing equipment and furnish cabin heat.

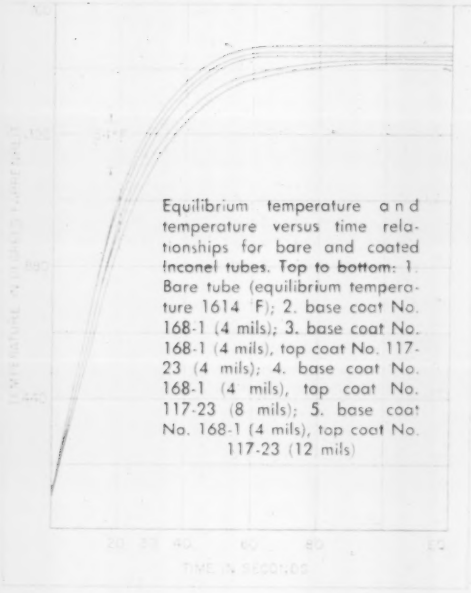
Possibilities Studied—In 1943, the University of Illinois and the power plant laboratory of the Air Force completed arrangements for a research program in the department of ceramic engineering. This project was conceived in an effort to find materials with which to replace alloys containing critically short metals. It has been fostered in an attempt to develop materials which can be used at temperatures in excess of those now possible in aircraft applications.

Flame temperatures of 6000°F or greater are possible in certain aeronautical applications. When temperatures exceed the melting points of iron and the heat resisting alloys, it is obvious that ceramic bodies rather than ceramic coated metals should be considered. However, in applications where the top temperatures are 2500°F or less, ceramic coatings have definite possibilities.

The university's department of ceramic engineering is concerned with the development of three particular types of ceramic coatings: (1) High melting but glassy base coats, with or without substantial mill additions of refractory material; (2) crystalline top coats bonded with a minimum amount of high expansion glass; and (3) high temperature ceramic



Fusion button tests on base coat frits were used to determine the refractoriness of ceramic coatings in University of Illinois tests



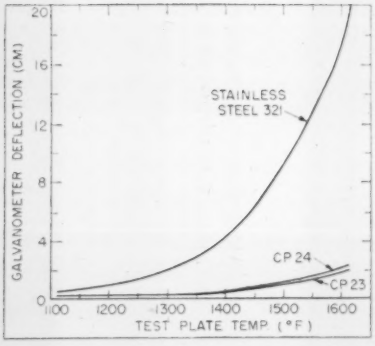
Equilibrium temperature and temperature versus time relationships for bare and coated Inconel tubes. Top to bottom: 1. Bare tube (equilibrium temperature 1614 F); 2. base coat No. 168-1 (4 mils); 3. base coat No. 168-1 (4 mils), top coat No. 117-23 (4 mils); 4. base coat No. 168-1 (4 mils), top coat No. 117-23 (8 mils); 5. base coat No. 168-1 (4 mils), top coat No. 117-23 (12 mils)

paints which can be applied in the field and will harden to a serviceable condition.

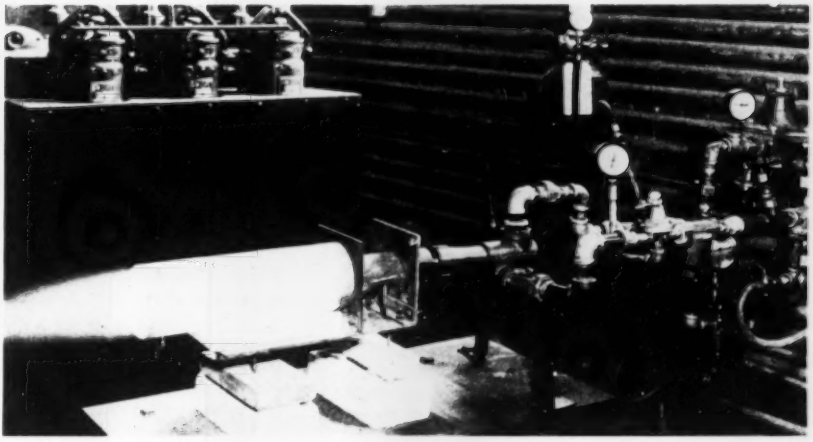
Useful Life Prolonged—In general, the purpose of such ceramic coatings is either to permit the use of metals at operating temperatures higher than are normally possible or to prolong greatly their useful life at conventional operating temperatures. More specifically, ceramic coatings may be utilized to: (1) Protect high temperature alloys against corrosion by the atmospheres encountered in service; (2) serve as gas barriers, permitting the use of higher gas temperatures; (3) smooth out temperature gradients in metals, reducing the occurrence of hot spots; (4) protect low alloy metals making it possible to use them in place of critical materials; (5) resist contaminants and facilitate decontamination.

Increasing the heat resistance of coatings made with commercial ground coat frits by including substantial amounts of refractory compounds as mill addition materials is the aim of work done at the National Bureau of Standards. In addition to increasing the general refractoriness of the coating, the material added also reduced cracking of the coating by thermal changes encountered in service. A blend of two frits is used in this coating, permitting variation in maturing temperature by varying the proportion of the hard and soft frit members. This type of coating is suitable for application to low-carbon steels, stainless steels, and to alloys such as Inconel. The firing temperature is generally in the neighborhood of 1600 F.

Alloy Steels Protected—Several coatings have been developed for protection of alloy steels which have as their basis frits which mature at temperatures in the 1800-1900 F range. The frits require considerably



Emissivity in visible red range for two high-temperature ceramic paint coatings about 50 mils thick as compared with uncoated stainless steel. In the case of coating No. CP 23, the radiation as compared with that of stainless at 1600 F was less than 10 per cent. These coatings are brushed or sprayed over grease-free metal and baked on by engine operation



This gas-fired thermal shock torch was used in University of Illinois tests. The cylinder coated with a high temperature resistant ceramic coating was the combustion chamber

higher smelting temperatures than do commercial enamel frits. The coating enamels generally consist of a blend of frits and may or may not contain additions of refractory material. This type of coating is successfully used on combustion chambers of gas turbines.

Some work has been done on alloy steel with a glass-like coating which may be classified as a modified barium aluminum silicate. One coating of this type matures around 2200 F. Ceramic coatings have also been developed for the protection of molybdenum tubes in contact with high temperature gases. Unprotected molybdenum metal decreases in thickness 0.02-inch in $\frac{1}{2}$-hour due to oxidation at 1650 F in an atmosphere. No decrease in thickness was found for ceramic coated molybdenum heated for 70 hours under the same conditions.

Different Kinds of Protection—In discussing the program on high temperature coating research carried out at the University of Illinois Prof. Dwight G. Bennett points out that due consideration was given to the kind of protection desired, the types and properties of the metals to be coated and to the types and properties of ceramic materials available in coating. Low carbon steel must be protected from rapid and progressive surface oxidation. High alloy steels are not subject to very rapid surface oxidation but under certain conditions some of them may develop grain boundary oxidation, or so-called intergranular corrosion.

In the case of a coating for iron or low carbon steel, the coating must fuse and seal off oxygen early in the heating cycle before excessive oxidation can take place. In the case of alloy steels, the fusion of the base coat must be delayed until sufficient metal oxide to produce good adherence is obtained.

These two extremes illustrate that a ceramic coating which just matches the oxidation rate of one particular alloy metal may not be suitable for another alloy metal with a different rate of oxidation. A further requirement is that the coating suitably match the thermal expansion of the base metal. Another requirement is that the coating must display long resistance to high temperature heating. This resistance involves two important properties, namely, a slow rate of solvent action of the coating upon the base metal and the heat stability of the coating itself.

While some coatings volatilize but little, others have been found to give up as much as 38 per cent of their alkali content upon long heating. Since the alkali oxides are notably of high thermal expansion, their undue loss will result in enamel coat chipping or spalling after long heating.

Metal Preparation Important—Metal preparation is an important factor, particularly in coating stainless steel and special alloy steels with heat resistant enamels. According to the University of Illinois workers, sandblasting is the one method of metal preparation that can be universally used for all metals. Metal that had been sandblasted prior to coating developed better adherence than metal prepared by any other method. This was true of the stainless steels, low-carbon steel and ingot iron. Ingot iron, low-carbon steel and 18-8 stainless type 321 could be coated after pickling in a hot 7 per cent sulphuric acid solution. The other alloys were more difficult to pickle and to coat after pickling.

In general, enamel slips for high-temperature application are prepared in the same manner as commercial enamel slips, except for refractory mill additions, increased water content, and the fineness of milling.

The amount of enamel that is applied will depend to some extent on the type of service required of the coating. It is desirable to limit the coating to the minimum thickness required to give protection and at the same time be practical from the standpoint of application. This optimum thickness usually falls between 0.002 and 0.004-inch. Maintaining a minimum thickness aids materially in avoiding tearing of the bisque coat during firing and is of great importance from the standpoint (*Please turn to Page* 96)

20 mm Fuze Noses

Fig. 1 (above)—Finished zinc die cast dummy shells (for fuze noses for 20mm practice firing) and other 20 mm shells

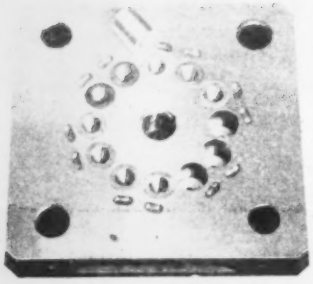


Fig. 2 (left) — One half of a 12-cavity fuze nose die showing nine of the 12 cavities, hobbed in cylindrical steel inserts, inserted in holes cut in the die block

LIKE many another die casting plant in the U. S., Rupert Die Casting Co., Kansas City, is now diverting a portion of its production capacity to ordnance and other direct military work. Typical of the ordnance components now being made at this plant are the M 99 and M 96 zinc die cast fuze noses for Army projectiles.

12-Cavity Die—The company is an old hand at this type of production since they turned out zinc die cast 20 mm fuze bodies in huge quantities for the Navy during World War II. The 20 mm Army shell fuze noses now in production are of two slightly different types, as shown in Fig. 1. The nose casting at the left is for a dummy shell fuze for practice firing (M 99) and the one at the right is for other 20 mm shell fuzes (M 96). Production technique is the same for both castings. In each instance, a 12-cavity die is employed for high speed production.

The individual cavities are made in cylindrical steel inserts positioned in holes cut in the die blocks. Fig. 2 shows one die block with 9 of the 12 inserts already in place. One of the inserts is shown resting on top of the die block. Great care is exercised in making these inserts. The cavities are first hobbed to the approximate dimensions of the fuze noses and are then machined to the exacting dimensions called for in the finished castings.

2700 Noses per Hour—The 12-cavity dies are used in high speed plunger-type die casting machines. Alloys with higher melting points than the zinc alloys cannot be used in these machines. On this job, the

Fig. 3 (below)—Fuze noses are cast 12 on a gate. Average casting speed is 225 to 250 "shots" per hour, or over 2700 noses every 60 minutes

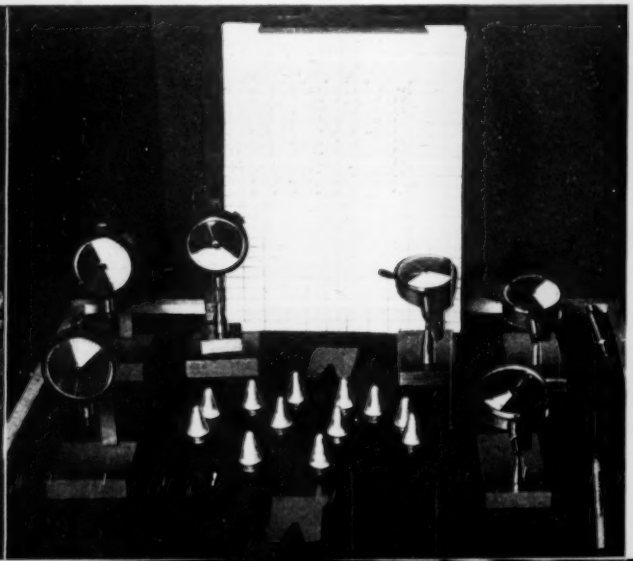


Fig. 4—This set of eight go and no-go gages is used to check the tolerances on 12 fuze nose castings on a gate taken from each die casting machine every hour

Zinc Die Cast at High Speed

Fast plunger type machines cast 2700 noses per hour, meeting close ordnance specifications for structural soundness and dimensional accuracy

machines are operated at an average speed of 225 to 250 "shots" per hour with 12 castings being produced, of course, with each shot.

In the casting operation, the gate of 12 castings is freed automatically from the die by ejector pins at each opening of the die. These pins bear on the metal runners of the gate so that the castings themselves are not marred by the pins. The machine operator removes the ejected gate of castings from the die using pliers, as shown in Fig. 3. The gate is then quenched in water to avoid warpage before it is placed on a conveyor to be transported to the next operation.

Tolerances Checked—Every hour a gate of castings is taken from each die casting machine for tolerance checks. Each of the 12 castings from this gate is checked in the set of eight go and no-go gages shown in Fig. 4. The tolerance checks are as follows: Overall, nose, wall (top), wall (bottom), inside diameter, visual (core), visual (cavity), concentricity.

If any of the castings are found to be off-size, the necessary corrective measures in the casting operation are taken immediately.

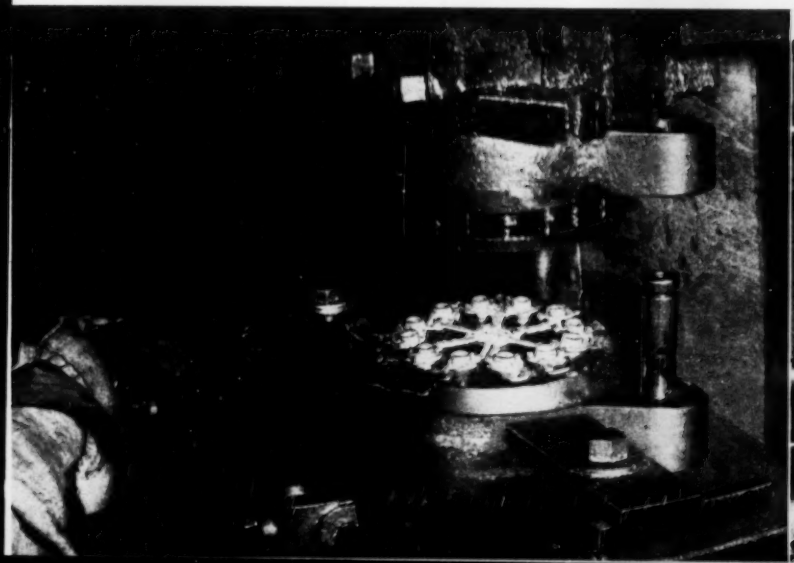
The 12 fuze noses are removed from each gate simultaneously in punch presses equipped with 12-cavity trim dies, as shown in Fig. 5. At each closing of the press the 12 castings are pushed through holes in the trim die and drop down a chute into tote boxes. The gates and the flash metal are, of course, salvaged and remelted for reuse in the die casting machines. There is no waste of the zinc metal which is so urgently needed in the defense program.

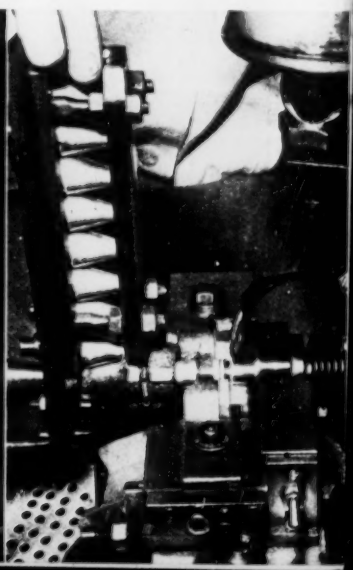
Lathes to Chucking Machines—As shown in Fig. 6, the noses are machined on lathes converted into automatic single-spindle chucking machines. These machines are equipped with vertical magazines to feed the castings automatically. In this final operation, the shoulder of each casting is undercut, grooved and threaded at high speed.

Final visual inspection of the finished fuze noses takes place at a table equipped with a conveyor belt to carry the castings to the workers seated at either side of the table. These workers are specially trained to separate and remove imperfectly machined castings from the belt. Those which are burred or dirty are returned for cleaning or filing; the perfect castings from this visual inspection go on to the shipping department. Before packing in egg-crate type cartons to protect the threads during shipment, castings are taken at random for final tolerance checks. If any casting is found faulty, the entire batch from which it was taken is checked.

Fig. 5—This punch press is equipped with a 12-cavity trim die which punches the 12 castings from the gate simultaneously

Fig. 6—One of the lathes used in machining the fuze noses, showing a vertical magazine being loaded with castings. The lathes are converted into automatic single-spindle chucking machines for undercutting, grooving and threading the fuze nose shoulders





Forgings Descaled 90 Per Cent Cheaper

ONE of the most difficult problems in production heat treating of steel forgings is the removal of furnace scale prior to machining. To solve this problem, Pennsylvania Salt Mfg. Co. has developed a heat chemical bath which completely removes this scale during quenching. In one plant, this new process accounts for cost savings of 90 per cent over previous methods used in industrial production.

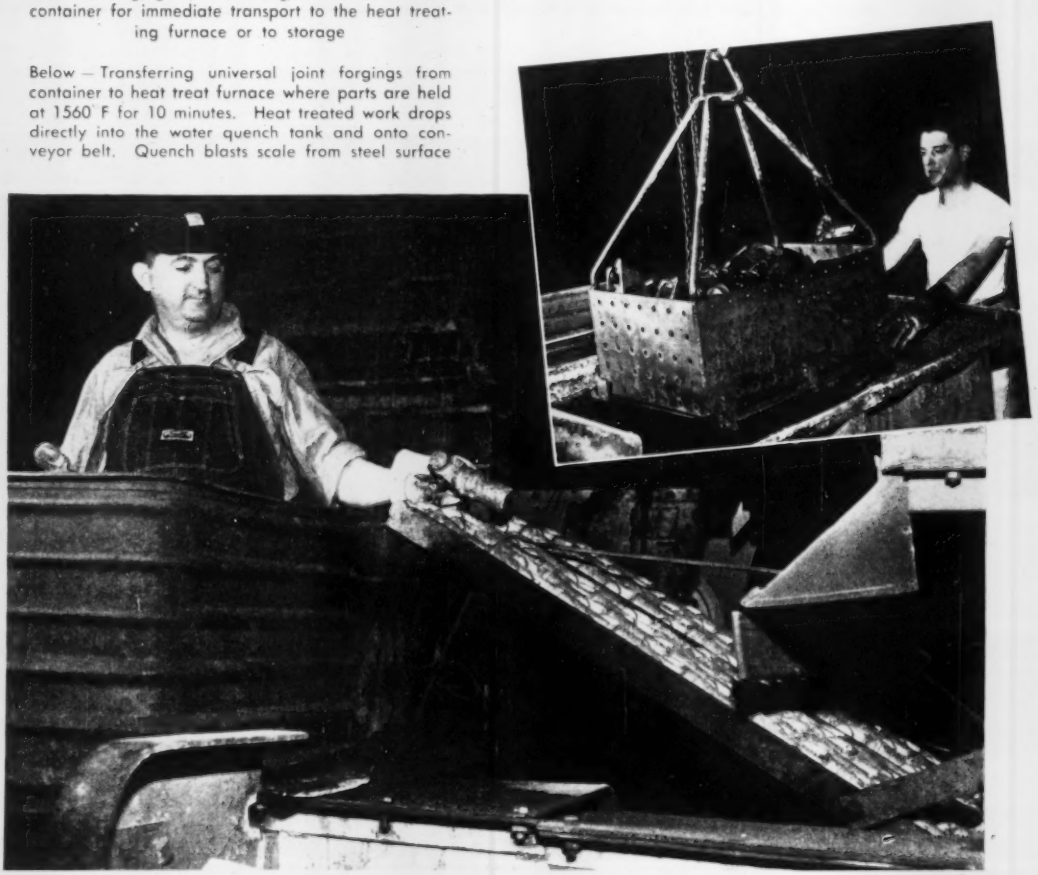
New Product—The bath is made up of a new product, Pennsalt SR-4, dissolved in weak muriatic acid and water. The product was developed from a practice originated at the Toledo, O., and Pottstown, Pa., plants of Spicer Mfg. Division of Dana Corp. Pennsalt and Spicer researchers co-operated in the development and in laboratory and plant tests.

Furnace or forging scale must be removed from all forgings before machining. These forgings, which are widely used in automobiles, trucks, tractors, railroad equipment, armaments and various types of machinery, must be machined to close tolerances. Forging scale is an iron oxide which is harder than steel, is very abrasive, and clings tenaciously to the forgings.

If it is not removed completely, it interferes with machine tool setting and quickly wears down cutting tools. If left on finished parts, pieces of the scale will eventually drop into mechanisms, such as transmissions, and wear away other working parts in short order.

Right—Withdrawing basket of forgings after 5-minute immersion in bath. After the basket is drained, forgings are discharged into a movable container for immediate transport to the heat treating furnace or to storage

Below—Transferring universal joint forgings from container to heat treat furnace where parts are held at 1560° F for 10 minutes. Heat treated work drops directly into the water quench tank and onto conveyor belt. Quench blasts scale from steel surface



Now in Production — The new product has been adopted by Spicer in several of its production operations. Heat treating and machining of a universal joint component is a typical example.

The new bath requires no heating and is made up in ordinary rubber-lined tanks. Dipping baskets can be made of simple sheet iron. Parts covered with forging scale are immersed in the bath for 5 minutes and then placed directly into heat treating furnaces, or stored for later heat treating.

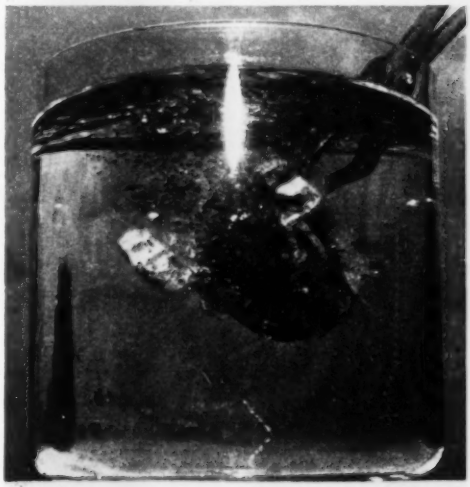
The universal joint forgings are heat treated at a temperature of 1560 F and soaked at temperature for the minimum time consistent with good metallurgical practice, which in this instance is 10 minutes. Temperature and time at temperature conditions are naturally dependent upon steel composition and forging size, and will therefore vary, based on metallurgical requirements.

Another significant saving results from the fact that the forgings can be heat treated in a non-reducing atmosphere or without a prepared atmosphere.

Scale Blasts Off—Following heatings, forgings are water quenched by immersing from the furnace directly into the quench tank. In a continuous operation a conveyor belt carries the work from the quench tank to the tempering furnace. According to Pennsalt engineers, when the forgings treated with SR-4 are water quenched, the scale actually blasts off from all surfaces, leaving them perfectly clean for subsequent machining.

Both laboratory tests and plant operations have shown that the new bath provides for complete removal of scale from carbon steel forgings, even from deep indentations and blind holes. The bath also removes scale efficiently after heat treatment in most cases where oil quenches are used.

Satisfactory results have been obtained in descaling plain carbon steel grades and some alloy steels. The product is currently undergoing field tests in other industrial plants in order to determine its effectiveness on remaining alloy compositions.



Above—Tenacious scale literally blasts from the surface of steel forgings treated with SR-4 at the moment they are dipped in cold water. The scale is frequently harder than the steel itself

Below—Treated steel forgings come from water quench free from forging scale (right). Piece on left, shown as it came from forge, shows how scale forms. Center piece is one which has gone through conventional heat treating and water quench, but without the new bath

Seen and Heard in

The Machinery Field

By GUY HUBBARD
Machine Tool Editor

MACHINE TOOL SUBCONTRACTING: With sudden discovery by authorities in Washington that the machine tool industry is one of the bottlenecks in the defense program—this after months of pleading by machine tool builders for help against just such a contingency—it is interesting to study some of the fantastic remedies suggested for this situation. A lot of people outside the machine tool industry seem to be bent on proving the truth of the old saying: "Fools rush in where angels fear to tread!"

Subcontracting—which is the basic ingredient in most of the suggested prescriptions—is nothing new to machine tool builders. They are well aware that like many strong medicines, it is a valuable emergency treatment when properly used, but a deadly one when improperly used.

The idea seems to be on the loose in Washington that machine tool builders are perfectionists who put perfectionism above our best national interests at a time of national peril. Those who subscribe to that idea would take machine tool building out of the hands of the so-called perfectionists and turn it over to "productionists" who supposedly would sacrifice perfection to attain quantity.

The fact of the matter is that modern production machine tools built to limits prevailing in production machine shops, would not themselves be suitable for use in other production machine shops turning out materiel on which lives of our servicemen depend. In the days of the earlier "five-year plans", Russia tried to build copies of fine American machine tools by similar quickie methods. What they built looked like good machines 25 feet away, but those who ran them discovered that the perfectionism which they lacked made them useful only on roughing operations.

On the basis of that experience, Russia has been striving for more than 20 years to copy the inner perfection—as well as the outer appearance—of American machines. They have made progress, but they still have a long way to go, which is something we can be thankful for at this time.

Mass production of machine tools by governmental ukase didn't work out in USSR. It won't work out in the USA. Subcontracting by machine tool builders under strict supervision of machine tool builders will work out—if governmental authorities will try to be helpful rather than meddlesome.

TRAP "DISCOMFORT" AT SOURCE: I have just made one of my always interesting pilgrimages to Carboloy, department of General Electric Co., Detroit. It was a hot day. A lot of potentially dirty operations were under way. Nevertheless, my trip through this metal-manufacturing and metal-forming plant was notably a cool, clean experience.

My outstanding impression is that Carboloy is a good place to work — despite prevalence of tumbling barrels, ball mills and machine tools working on carbon and carbon mixtures, and many furnaces going full blast. No one was hot, no one was dirty, no one showed any sign of those strains that do-gooders associate with mass production.

Someone once described "dirt" in industry as "something entirely respectable but which gets into the wrong places". That certainly is true of the carbon and rare metals and other ingredients involved in manufacture of Carboloy. By the same token, discomfort due to high temperatures in plants involving furnaces, could be described as "heat misapplied to humans which should be confined to materials".

Being impressed by the benefits of control of materials and of heat, designed to keep both out of the shop atmosphere and in their respective useful orbits, I paid particular attention to ways and means of doing this at Carboloy. Two things were immediately apparent—one being that both heat and materials are confined as far as possible, the other being that where heat and materials momentarily do escape, they promptly are recaptured and drawn off before they are completely at large.

To accomplish this, insulation, ventilation and suction exhaust systems have been engineered around every dust and heat-creating operation and process. Closely surrounding every turning, milling and grinding operation, for instance, are vacuum cleaner hoods which catch flying particles the moment they become airborne. The consequence is that lathe operators who machine carbon and wear white aprons—still have white aprons at the end of the shift.

All this requires miles of ducts, tons of air and possibly some extra expense for winter heating. The cost of all this is far outweighed, however, by improved health and morale, uncontaminated products, longer useful life for equipment, considerable recovery of scarce materials which otherwise would be just "dirt" and a definitely good impression on prospects and customers who visit the plant.

Any industry, restaurant or nation which today feels bound to operate its shops, its kitchens or its government activities behind an "Iron Curtain," deliberately is encouraging belief that its operations are unclean. That certainly is not the American way "to make friends and influence people".

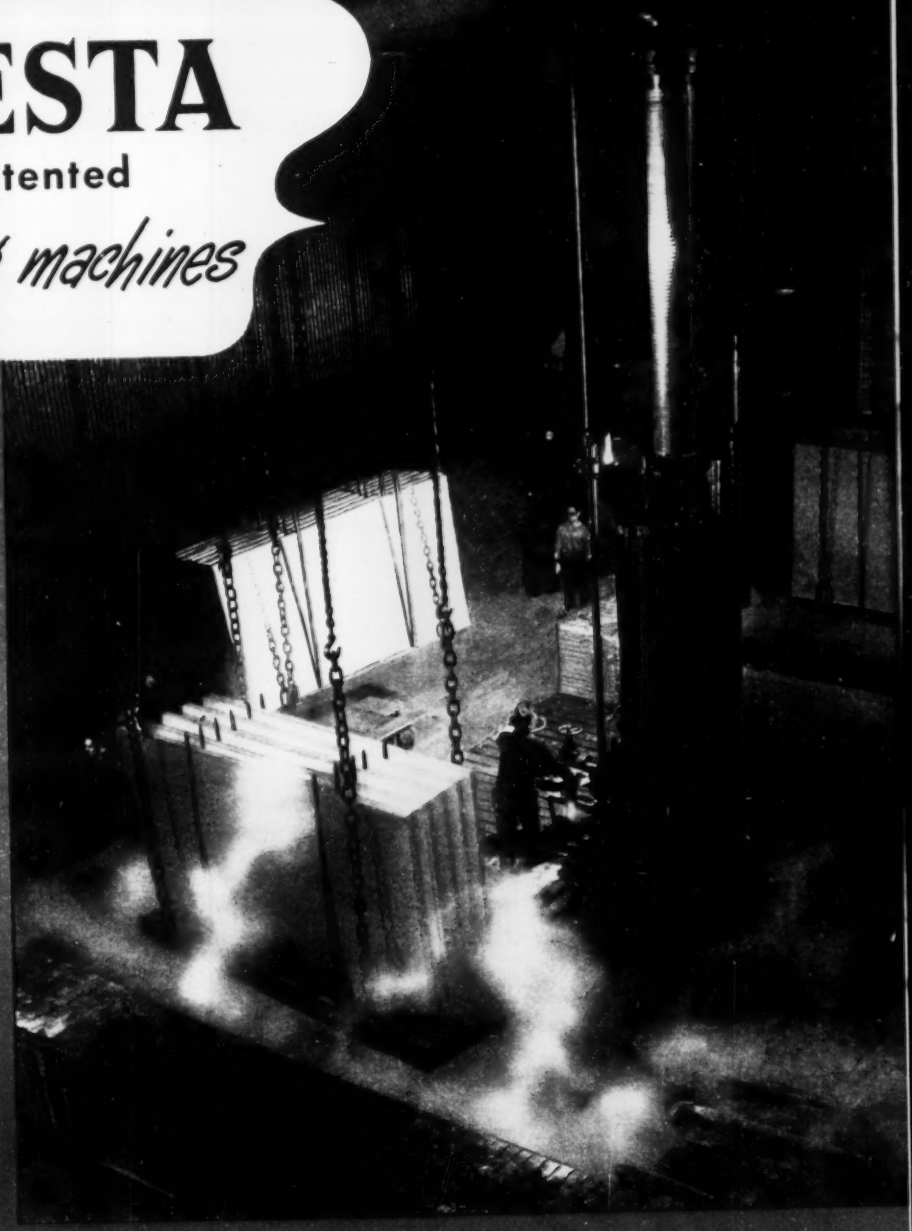
BACK TO FUNDAMENTALS: Detroit has become a machine tool center in terms of building as well as in terms of use. Of the 90 cities now listed as homes of member companies by National Machine Tool Builders' Association, the Motor City now rates as No. 3 in number of members—with 12 machine tool shops.

Every machine tool group has regional characteristics. I detect in Detroit a strong tendency on the part of designers to start reasoning in terms of basic association between actual workpieces and cutting tools. They seek to materialize this association so as to attain maximum production and accuracy with minimum of mechanism. That certainly is sensible engineering—especially these days when machinery shortages are aggravated by scarcity of materials.

MESTA

patented

pickling machines



DESIGNERS AND BUILDERS OF COMPLETE STEEL PLANTS

MESTA MACHINE COMPANY

PITTSBURGH, PA.

How To Determine Industrial Truck Battery Requirements

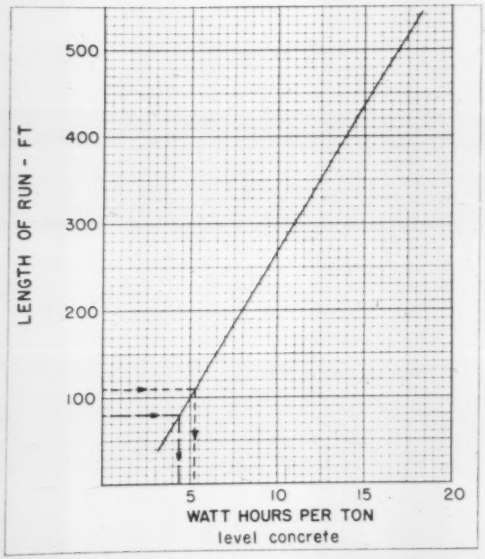
By J. E. VAUGHAN
Supervisor Field Engineering
Gould-National Batteries Inc.
Trenton, N. J.

DETERMINING capacity of storage batteries which power electric industrial trucks is often left to the truck supplier, the battery representative, just plain guess, or duplication of present batteries. However, there is an engineering procedure, which, if followed, will enable the purchaser to specify correctly his own battery requirements or check suppliers' recommendations. In addition, these calculations will insure against purchasing under-capacity batteries which run down before the end of the shift, or conversely, over-capacity batteries calling for unwarranted initial cost.

For Example—Assume a typical case—a 3650-pound truck, 2000-pound load, 3-foot average lift, 110-foot average haul and 30-foot 10 per cent grade to be traversed by loaded trucks.

It will be necessary to determine the power (watt hours) required to traverse the average haul distance loaded, climb the grade, traverse the haul distance empty (grade deducted), lift the load for stacking and tilt the mast for load-centering.

The accompanying graph indicates the watt hours per ton required to move a truck along a given length of level run. This graph can be used to determine the power required to travel the average haul distance. Following the dotted lines 5.4 watt hours are required to haul 1 ton along the 110 foot haul. The total load is 3650 pounds (truck) plus 2000 pounds (load)—5650 pounds, or 2.825 tons. Multiplying 2.825 tons by 5.4 watt hours gives 15.25 watt hours required for the level run.



More Watt Hours—Watt hours required for going up grade (in addition to that required for level running) can be determined by using the formula: Watt hours = tons (truck plus load) × feet (length of grade) × grade (per cent) × 0.013 (a constant). 2.825 tons × 30 feet × 10 × 0.013 = 11.02 watt hours (extra power for grade).

Then to calculate watt hour requirements for the return trip, deducting the grade, the 110 feet total return distance must be computed less the 30 feet of grade, or 80 feet. Again using the graph (dash lines), 4.4 watt hours are required per ton on the return trip. As the weight is now 1.825 tons, multiply 4.4 watt hours by this figure, getting 8.03 watt hours.

To determine the watt hours required for lifting, use the following formula: Watt hours per lift = tons of load × feet of lift × 2 (a constant). Thus, 1 ton × 3 feet × 2 = 6 watt hours required to lift the load. (For unstacking, the following formula applies: Watt hours per lift empty = $^1/_3$ load capacity in tons × feet of lift × 2.)

Tilt the Mast—To determine the energy required to tilt the mast, use the following formula: Watt hours per tilt loaded = tons of load × 1 (constant). Thus 1 ton × 1 = 1 watt hour per tilt loaded. (Watt hours per tilt empty = $^1/_3$ load capacity × 1.)

Summing up:

	Watt hours
Run with load, no grade	15.25
Extra power for grade	10.02
Run empty, grade deducted	8.03
Power required per lift	6.00
Power required per tilt	1.00
	41.30 per trip

Assuming 250 trips per day, a total of 10,325 watt hours of battery power are required. A 32-volt battery, as recommended by truck manufacturers for this size truck, must have approximately 323 ampere hour capacity. (Ampere hours equal watt hours divided by volts, hence the ampere hours required equals 10,325 watt hours, divided by 32 volts or 323 ampere hours.) Battery manufacturers' catalogs give ampere hour capacities of various sized cells.

By following this procedure, the purchaser can effect economies which will be reflected in multiple since future purchases of batteries for given applications will be based on original computations.

Formulas used are from the *Handbook of Material Handling* published by the Electric Industrial Truck Association, 1950.

LINDE'S News of Metalworking

Braze-Welded Repair Saves Six Months' Production Time

When the base of a 5-ton alligator shear cracked in service, early return to normal plant operation appeared hopeless. Delivery of a new shear was six months away . . . cost $1,800.

But LINDE service engineers suggested braze-welding. Within a few days the shear was back in service—permanently repaired at a cost of only $355. This single braze-welding job saved the manufacturer $1,445 and six months of valuable production time.

Similar typical savings account for widespread industrial acceptance of braze-welding as a quick, easy way to join steel, cast iron, malleable iron, and many dissimilar metals. And routine repairs by braze-welding are often made without dismantling machines. Shut-down time is always kept to a minimum.

Why not save the cost, delivery, and installation time required for that new part? Put the old one back on the job with braze-welding.

Braze-welding is only one of many time- and moneysaving LINDE methods for making, cutting, joining, treating, and forming metals. For further information, call or write our nearest office today.

Replacement of this $1,400 ring gear would have taken more than six months. Braze-welding at half the cost rebuilt badly worn teeth and restored the gear to service in just a few days.

What's News

► One steel company has found their OXWELD C-60 Cutting Blowpipe so effective in reducing large pieces of scrap that they are now purchasing quantities of large-size scrap to process themselves.

► Saran and polystyrene, previously resistant to speedy pulverization, are now being successfully ground by LINDE'S new liquid nitrogen pulverization method. . . . Efficiency is such that the new process pulverizes some previously difficult-to-grind materials at rates over 700 lb. per hr.—using small mill hammers.

► Magnesium hydraulic systems for landing gears were formerly discarded at an airplane shop when pinhole leaks appeared. Now, thanks to HELIARC welding they're repaired at a saving of $500 each.

"LINDE" SERVICE DOESN'T COST — IT PAYS!

LINDE AIR PRODUCTS COMPANY
A Division of Union Carbide and Carbon Corporation
30 East 42nd Street UCC New York 17, N. Y.
Offices in Other Principal Cities
In Canada: DOMINION OXYGEN COMPANY, LIMITED, Toronto

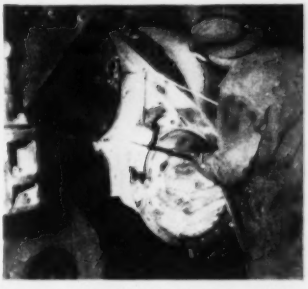
"Irreplaceable" Cylinder Back at Work in 20 Hours

It looked as if "old faithful" was headed for the scrap pile when overworked pistons snapped and cracked the cylinder of a 1904 model railroad locomotive. To replace the cylinder would have been next to impossible. But braze-welding had "old faithful" back at its lumber mill job in only 20 hours.

Repairs were made without dismantling. After the crack was prepared for welding, the cylinder was covered with asbestos paper and preheated. Then the crack was welded, and the cylinder rebored. Total preheating and welding time was 13 hours.

Repairs cost only $138, including materials, labor, and overhead. Even if the cylinder could have been replaced—at a cost over $4,000—the locomotive would have been idle many months instead of the few hours required to make the repair.

Rapid repair of unavailable or hard-to-get parts is a natural job for braze-welding. Try it yourself, next time you're bothered with a troublesome replacement problem.



Braze-welding this locomotive cylinder without dismantling saved a lumber company more than $4,000. On special jobs like this, LINDE service and supervision assures success.

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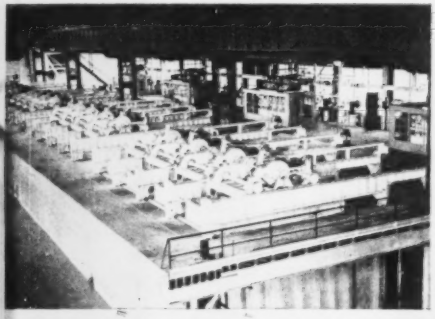
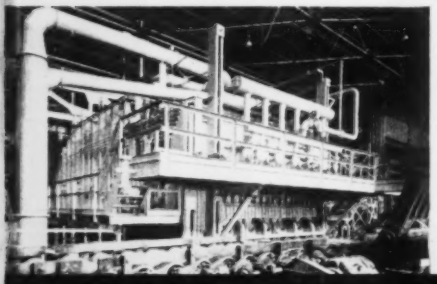


Slab heating furnaces.



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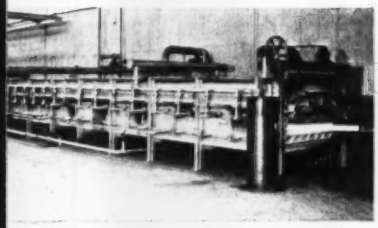
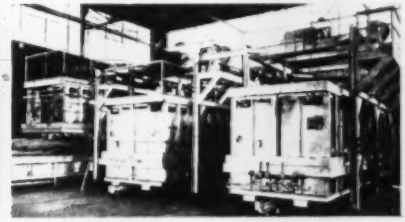
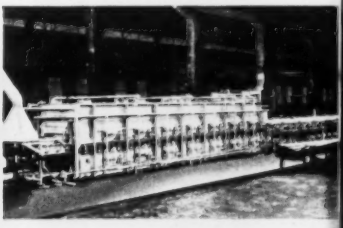


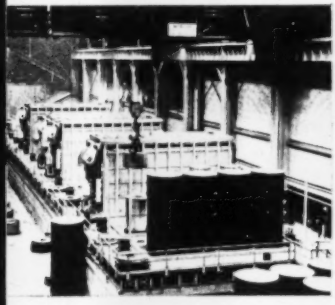
Batch type carbon correction annealing furnaces.



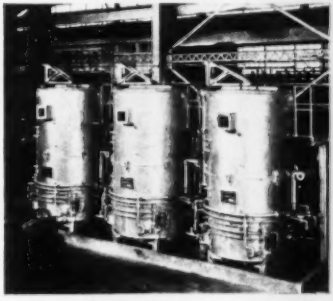
Continuous bright annealing and normalizing furnaces for tubing.



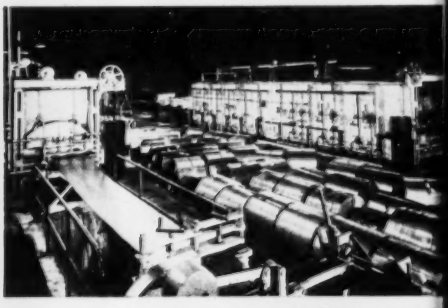
Controlled atmosphere coil annealing covers.



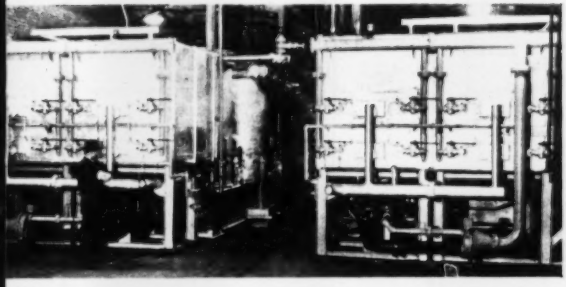
Pit type convection furnaces for rod annealing.



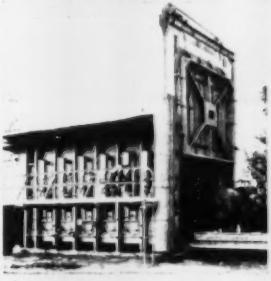
Continuous strip annealing and normalizing furnaces.



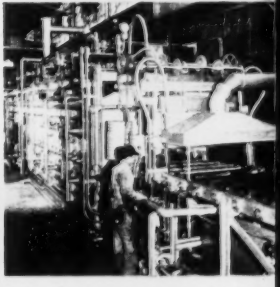
Prepared atmosphere generators.



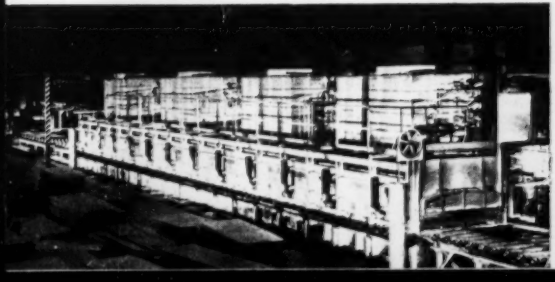
Stress relief furnaces.



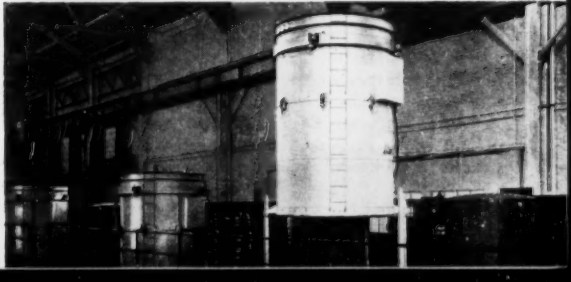
Continuous controlled atmosphere annealing furnaces.



Continuous armor plate heat treating furnaces.



Controlled atmosphere wire and rod annealing covers.



COLD ROLLING STRIP

An appraisal of today's theory and practice

In this final article of the series the author explains why the rolls become stiffer under high-speed rolling, discusses reasons for end thrust and spalling of rolls and cites the advantages and disadvantages of tungsten carbide rolls

By J. D. KELLER
Consulting Engineer and Partner
Associated Engineers
Pittsburgh

PART VIII

STRESS in mill rolls is not reversed but repeatedly varies between zero and maximum. However, the effects are similar to those shown by the tests of Ewing[41] and Muir[45] on semimild steel. Even after only a single stressing to somewhat beyond the yield point followed by complete release of load, when the steel was reloaded within a few minutes thereafter, the stress-strain curve was found to have changed entirely, to a shape resembling that of cast iron, as shown by the the solid-line curve in Fig. 30; the equivalent modulus of elasticity was much reduced, but actually there was no yield point since the extension increased faster than the load even at a stress of only a few thousand psi, and no true elastic range since creep was observed to occur almost from the beginning of the reloading (Ewing). The elastic condition could be restored, however, by heating the steel to about 212 F and holding at that temperature for a few minutes.

Speed Influences Width of Loop—For slow changes of load, the hysteresis loop for repeated loading and unloading is shown in Fig. 31, as given by Ewing.[41] No test data seem to be available concerning the variation of the width of the loop with speed of deformation, but since this is a creep effect it is almost certain that the loop will become much narrower at high speed, just as in the case of reversed stress, (Fig. 29-a and b). The change of strain would then be much less at high speed than at low speed and only a little more than that occurring in the original elastic state.

All of the preceding is based on the yield point being exceeded at least slightly. If any part of the roll is actually strained beyond the elastic range and is being plastically deformed, at any instant, it is only a small region near the middle of the contact length and at a depth below the surface equal to about 3/10 of that length, as indicated by the cross-hatched area in Fig. 32. As the roll turns and each small portion of the material at this depth passes out of the plastic-deformation region, because this portion has acquired a slight permanent set the surrounding parts which have not been stressed beyond the elastic limit retain a residual stress* which tries to pull the deformed element back to its original dimensions. This is the condition corresponding to relaxation of stress, which is a time effect similar to creep.

Susceptible to Relaxation—If the yield point of the plastically deformed portions has been drastically lowered due to the Bauschinger effect, they would be in a condition especially susceptible to relaxation. At low speeds, the time elapsing while each small element of the roll passed around the circumference of the roll might be sufficient to permit considerable relaxation to take place and the plastically deformed element to regain almost its original shape and dimensions before it again entered the region of contact and high stress, and was again plastically deformed; whereas at high speeds the time would be too short to permit any appreciable regain, and each element, remaining deformed and prestressed as it again entered the region above the contact length, would suffer no further plastic deformation but only

* This is distinct from the high residual stresses produced in the roll body by quenching, which sometimes causes the roll to fly into pieces during the process of manufacture.

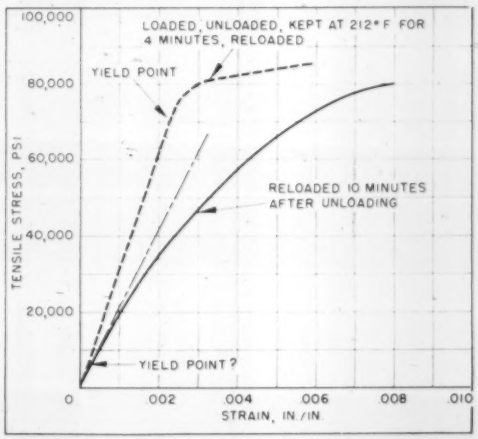


Fig. 30—Change of stress-strain curve of semimild steel after unloading and reloading. (Muir[45])

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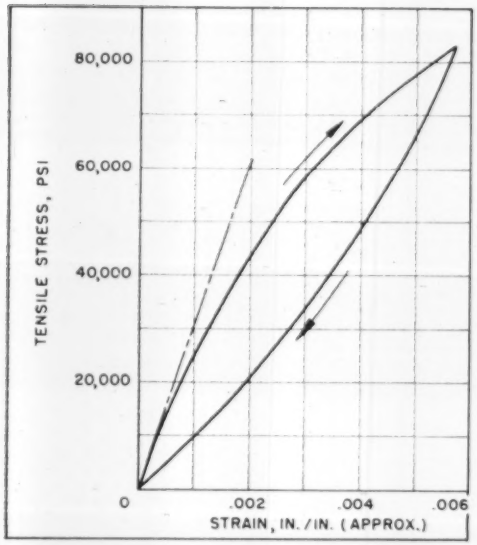


Fig. 31—Plastic-hysteresis loop of semimild steel for repeated but nonreversed loading. (Ewing [44])

elastic deformation, hence the roll would behave as if more rigid or stiffer at high speeds.

There is also the possibility of suppression of the Bauschinger effect and restoration of normal elasticity at high speed but not at low speed, due to the temperature effect observed by Muir and heretofore stated. This would require a temperature at or above the boiling point of water, at high speeds, and much lower temperature at low speeds. It seems improbable that the roll temperature would rise and fall quickly enough to make the difference.

The question might be asked, why should the speed effect be of importance so far as concerns deformation of the rolls, but not for deformation of the strip? In cold strip mills, at rolling speeds from 200 to 4000 fpm, the range of the rate of strain *in the rolls* is probably from 0.005 to 0.100 (1/seconds), approximately, and the range of the rate of deformation in the strip itself is from 25 to 500 (1/seconds), about. From the curves of Brown and Vincent or of Whiffin, in Fig. 19, the increase of yield strength over these ranges should be about 6 per cent for the roll material, and about the same if not somewhat more, for the strip material. The effects of the two might therefore be expected to cancel out.

Deformation Rate Affects Yield Strength—The answer to this question lies in the curves of Fig. 33. Referring to the Brown and Vincent curves in the latter, it will be noticed that there is a considerable increase of the *yield strength*, from *A* to *B*, as the deformation rate is increased, and it is in this region that the roll material works (where practically no work-hardening takes place). On the contrary, there is little if any increase of the *ultimate strength* with speed of deformation, from *C* to *D*. From Ford's curves in Fig. 33, it is evident that for all passes later than the first, or for strain (or reduction of thickness of strip) in excess of about 15 per cent from the initial hot-rolled strip, the work-hardening has progressed so far that the yield strength in the later passes practically coincides with the ultimate strength, and therefore the pressure exerted by the strip on the rolls should be independent of the speed of rolling.

Even this is not beyond question, however, since there is a contradiction between the results of Brown and Vincent[46], who found practically no change in the ultimate strength, and those of Nadai and Manjoine[47], whose extrapolated results shown in Fig. 19 seem to show a decided increase of the ultimate strength with increasing strain rate.

Finally, there is the effect of increase of the friction coefficient (Figs. 15 and 18) as the speed is decreased; with corresponding rise of the friction hill. This might fully explain the observed decrease of roll force with increasing speed. The author's opinion, however, as of the present, is that a *combination* of the friction variation and the just-described stress-strain effects in the rolls will be found to be responsible. Furthermore, Polakovski's explanation of the effect of changing coefficient of friction on the nature of the plastic deformation of the strip—homogeneous or nonhomogeneous—remains a possibility.

Variation of the strip gage with speed has been a serious problem, but in mills of the future it should be less so. This is true even in those recent cold strip mills which are provided with four motors for each of the later stands in order to reduce inertia, and which therefore accelerate so quickly that the length of off-gage strip amounts to only about 100 feet at each end of a coil.

End Thrust of Rolls Once a Problem—Ten or 12 years ago, end thrust was a serious problem. In some cases, this caused continually recurring breakage of the longitudinal bolts holding the bearing caps, and it was even dangerous to stand in line with the ends of the rolls, for the heads of the breaking bolts were thrown out like bullets.

End thrust is due to misalignment or "crossing" of the rolls, which tends to produce an axial movement that can be overcome only by a longitudinal force sufficiently great to cause slight endwise slip of the rolls on each other or on the strip. Theoretically, for rigid rolls, the magnitude of the angle between the axes of the crossed rolls makes no difference except, as pointed out by J. H. Hitchcock, to the extent that the cosine of half the angle of crossing differs from unity; a

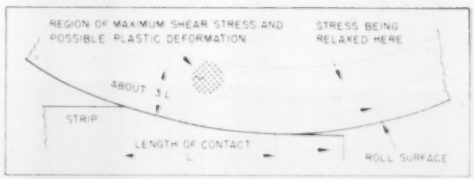


Fig. 32—Location of maximum stress, and relaxation of stress in roll

This series of articles, which has been presented in the Feb. 19, March 5, 19 and 26, May 14, July 9 and 23 and Aug. 13 issues of STEEL, is far from being a complete treatment of the subject, but the most important points have been covered. The author wishes to thank those who have helped in the preparation of the treatise by furnishing information and by their illuminating discussions, including J. H. Hitchcock, Morgan Construction Co., M. Stone, United Engineering & Foundry Co., Prof. W. Trinks, and J. R. Powell, Jones & Laughlin Steel Corp.

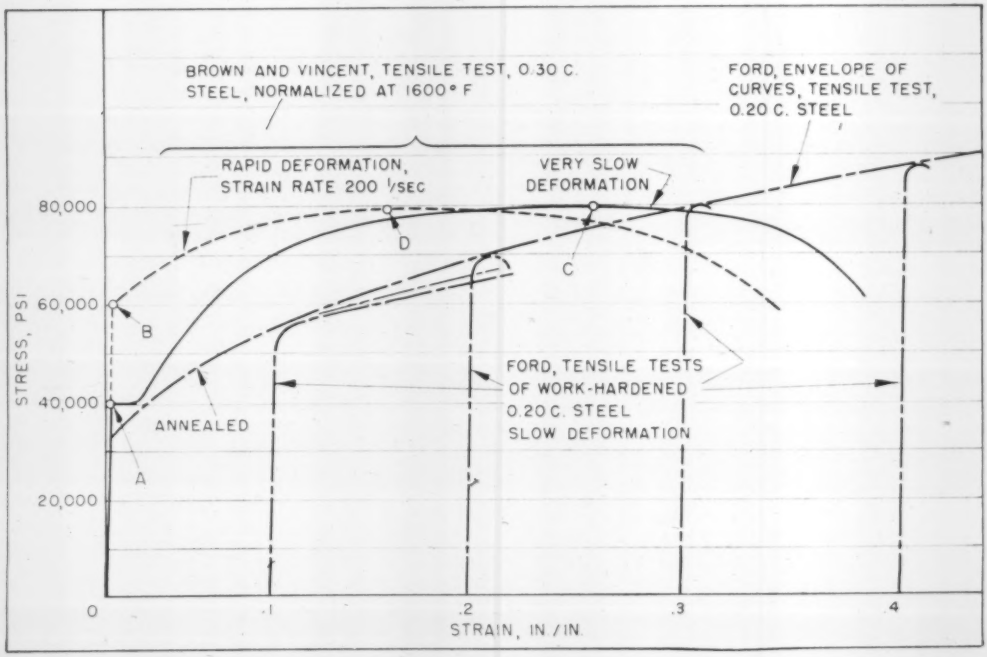
thousandth of a degree is as bad as a degree, in mills like cold strip mills where the roll pressure is not released at short intervals but kept on for a long time, or for a large number of revolutions. Actually, however, a sort of elastic creep seems to occur between the contacting roll surfaces, which corrects for minor misalignment or crossing of the rolls and, if the angle is very small, relieves the end thrust to a considerable extent. More recently, therefore, the bolt breakage has been almost eliminated and end thrust minimized by maintaining roll alignment that is almost mathematically perfect. Adequate thrust bearings are, nevertheless, required and provided in the backup roll bearing blocks.

Spalling of Rolls Largely Eliminated—Formerly, roll spalling usually resulted from the attempt to obtain the required total reduction in too few passes. For example, in the old reversing cold strip mill installed at Aliquippa about 1933, with which the author was familiar intermittently from its first planning, the reduction from boiler-plate thickness (about $\frac{1}{4}$-inch) to tinplate gage (about 0.01-inch) was effected in seven passes without intermediate annealing. The work-hardening of the strip was extreme, and the roll pressure excessive. "Dinner plate spalling", in which pieces the size of a dinner plate and about 1-inch thick were broken out of the rolls and thrown to a distance in the shop, was by no means an infrequent occurrence.

Roll spalling since has been largely eliminated by limiting the total cold reduction to about 90 per cent before annealing, and by using smaller reductions per pass. This was the reason for going from the four stands formerly used in tandem mills to the five stands used at present. Makers of the rolls also have helped by producing rolls having just the right compromise between hardness and ductility. For work rolls in the finishing stands, a hardness of about 95 scleroscope seems to be approximately the standard at present.

In present practice, the most frequent cause of spalling is bruising or excessive local stressing of the rolls resulting from a wreck in the mill, that is, tearing or breaking of the strip with doubling-over of the broken ends and subsequent passage of the double thickness between the rolls, or doubling back of the strip between the backup roll and the work

Fig. 33—Effect of speed of deformation and of work-hardening on stress-strain curves of mild steel. (Brown and Vincent [10], and Ford [1])



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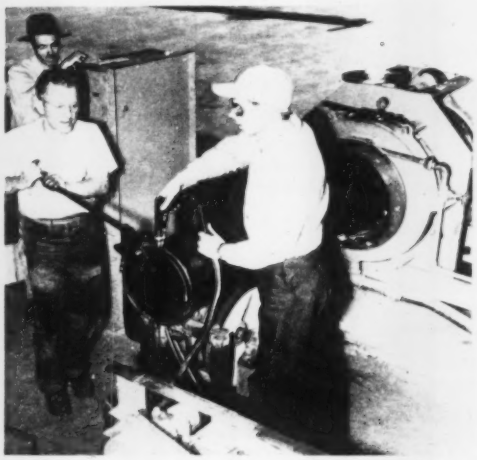
roll while another part of the strip is between the two work-rolls. Practically every spalled roll when its history is traced, is found to have undergone a severe wreck when rolling.

Use of Tungsten Carbide Rolls—This material is now being introduced for work rolls to produce thin steel strip, especially where smooth surfaces are required.[43] To date, it has been used only for rolls of small size, but should be desirable for larger rolls if the economics of its use should warrant it. Tungsten carbide has a modulus of elasticity more than three times that of steel. The flattening of the rolls and consequent increase of contact length should therefore be greatly reduced. The material is hard, has extremely high compressive strength and takes an extraordinarily smooth polished finish.

Aside from high cost, its drawbacks appear to be a rather low strength in torsion or shear, and a possible tendency for the steel strip to weld to the roll surface under extreme pressure. It is known that tungsten carbide cutting tools show this tendency, but the only known indication of it in rolls seems to be the observed increase of heating of the rolls for a given speed and strip reduction, as compared with steel rolls—and this, in spite of the reduced length of contact, higher thermal conductivity, and smoother surface of the rolls. The only alternative explanation of the greater heating would seem to be an increase of surface friction due to that very smoothness of surface; it is known from automotive engine experience and practice that lubricated rubbing surfaces can be *too* smooth, if the depressions and pockets which provide minute oil reservoirs (Figs. 12 and 15) are eliminated by the smoothing.

Spot-Welded Cap Protects Pipe



PROTECTION during shipment for 12¾-inch pipe is provided by spot-welding a cap with a 1-inch lip on each end using a Heliarc HW-8 torch marketed by Linde Air Products Co., New York. Kaiser Steel Corp. fabricated the 10,000-ton order at its Fontana, Calif., works and found that tack-welds originally specified could not be made consistently between the 0.040-inch cap and the 0.250-inch wall pipe. A special clamping device was designed to press the cap tight to the pipe where the three spot welds were made. A single torch not only kept up with an 8-hour a day mill production but caught up with a backlog of 2000 lengths of pipe in stock

REFERENCES

44. J. A. Ewing. "Strength of Materials," Cambridge, 1906, second edition, pp. 35-38.
45. J. Muir, Phil. *Trans.* Roy. Soc., 1899.
46. A. F. C. Brown and N. D. G. Vincent, *Proceedings* Inst. Mech. Engrs., v. 145, 1941, pp. 126-134.
47. A. Nadai and M. J. Manjoine, *Trans.* ASME, v. 63, 1941; also *Journal Applied Mechanics*, pp. A-77—A-91.
48. R. T. Beeghly, *Iron and Steel Engineer*, Sept. 1950, p. 83.

Since this series of articles was written, the papers by J. R. Powell (reference 27) and by Geo. R. Kaufman (reference 28), have been published in *Iron and Steel Engineer*, v. 28, Jan. 1951, pp. 73-78 and discussion, pp. 80-82.

Papers which since have appeared on the subject of cold rolling of strip are: H. Ford, F. Ellis and D. R. Bland, *JI.* Iron and Steel Institute, v. 168, May 1951, pp. 57-72; L. R. Underwood, *Metal Industry*, Feb. 27, March 5 and 19, 1948; and L. R. Underwood, *Sheet Metal Industries*, April, 1950.

Test Pinpoints Magnesium Content

Addition of small amounts of magnesium to cast iron has received increasing attention recently because it imparts desirable ductile qualities to the iron, apparently by producing a nodular or spheroidal graphite structure. Because a variable part of the added magnesium is lost during the production of the cast iron, the final magnesium content must be determined by chemical or spectrographic analysis. Although spectrographic methods are quicker for routine examination, a suitable chemical method is needed, both for checking spectrographic standards and for use in laboratories not equipped for spectrochemical methods. An answer to this need is offered by a chemical method developed by John L. Hague and James I. Shultz of the National Bureau of Standards.

In this method, the cast iron sample is dissolved in hydrochloric acid and the iron removed, after oxidation, as the chloride by ether extraction in a continuous extractor. Magnesium, together with part of the manganese, is then precipitated as phosphate from an ammoniacal citrate solution. After dissolving this phosphate precipitate in diluted acid, the manganese is removed by precipitation with ammonium persulfate as manganese dioxide. The magnesium is then precipitated as the phosphate, ignited, and weighed as $Mg_2P_2O_7$. Finally, the weighed pyrophosphate precipitate is examined for calcium by the sulfate-ethanol procedure, and any necessary weight correction is made.

Reliability of the method was checked by making a number of determinations on several standard samples of iron to which had been added known quantities of magnesium. Between 0.01 and 0.10 per cent magnesium was added, the usual range in nodular cast iron. Calcium and cerium were also added to a few samples, as calcium may be present in some cast irons, and as cerium is sometimes added to induce a nodular structure. Results indicate that the method is applicable to most plain or low alloy irons, and also that moderate amounts of calcium and cerium do not interfere. Accuracy of the order of 0.002 per cent of magnesium was indicated for the range investigated.

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Here's the solution to your government packaging problems. This new NOX-RUST chart gives you Federal rust preventive specifications and a complete list of NOX-RUST products conforming to each. You will find products to meet Military, Joint Army-Navy, Army, Navy, Air Force and Ordnance requirements. It's all here in handy chart form that shows the uses, application and removal, physical description, protection afforded and miscellaneous data on frequently needed products. If you are packaging for Uncle Sam, you need this chart. It's yours as part of NOX-RUST'S service to industry.

RUST PREVENTIVES TAILORED TO YOUR NEEDS

Do you have a rust preventive problem? Consult NOX-RUST . . . World's Largest Producers of Rust Preventive Coatings. Let a NOX-RUST representative help you find the best possible rust preventive for each individual need. Write today for further information.

STOP RUST WITH PAPER

Have you heard about the amazing new VAPOR-WRAPPER that delivers your parts "factory fresh" without the use of oil or grease-type rust preventive coatings? Send for booklet that describes the product and gives case histories of leading firms using VAPOR-WRAPPER.

NOX-RUST CHEMICAL CORPORATION
2481 South Halsted Street
Chicago 8, Illinois

Please send your (check one or both)

_____ Federal Specification Chart _____ Vapor-Wrapper "How" Book

NAME _____

COMPANY NAME _____
(or use company letterhead)

ADDRESS _____

CITY _____ STATE _____

NOX-RUST CHEMICAL CORPORATION

America's Leading Producers of Rust Preventive Products

2481 South Halsted Street • Chicago 8, Illinois

BALTIMORE • SAN FRANCISCO • DETROIT • PHILADELPHIA

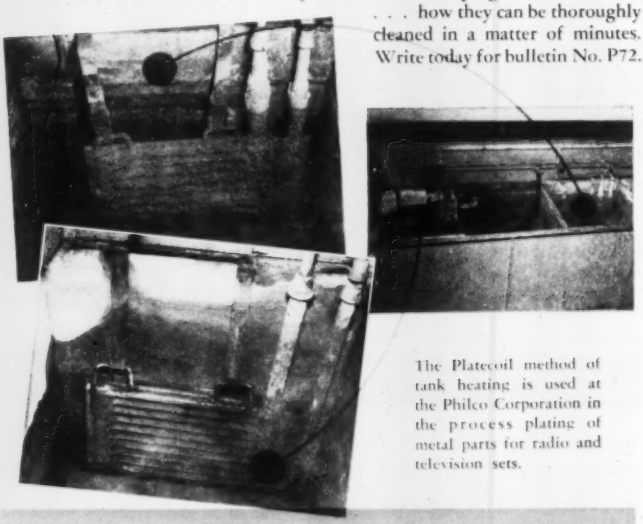
PHILCO finds

"platecoils have better heat conductivity than any similar coil"

The Platecoil method of tank heating is being used by the Philco Corporation of Philadelphia in the process plating of metal parts for radio and television sets. Although the Platecoils haven't been used very long, Philco production officials say they are "most pleased with the results that have been thus far obtained." They've found that, at least in their operation, the Platecoils are self cleaning . . . which saves many hours of maintenance time. They've found, too, that Platecoils have a much higher rate of heat conductivity . . . which means faster tank heating.

Platecoils have a greater BTU transfer because they have more prime surface in a given area. A 22"x47" Platecoil gives the same heat transfer surface as 32 ft. of 1½" pipe. Thus Platecoil saves about 50% over equivalent pipe coil. Think what this means to you in lower initial cost, lower installation and handling costs.

Learn too, how Platecoils can be replaced without dumping the tank solution . . . how they can be thoroughly cleaned in a matter of minutes. Write today for bulletin No. P72.



The Platecoil method of tank heating is used at the Philco Corporation in the process plating of metal parts for radio and television sets.

PLATECOIL gives you these ADVANTAGES

- Cleaned and Repaired Without Dumping Tank Solution
- Greater BTU Transfer Per Unit Area
- Weighs Only Half as Much as Pipe Coil
- No Threaded Joints in Tank
- Increased Tank Capacity
- Fast, Easy Installation
- Easy to Clean

PLATECOIL
Division
KOLD-HOLD MFG. CO.
LANSING 4, MICHIGAN

Heat Resistant Coatings

(Continued from Page 77)

of increasing resistance to failure under conditions of thermal shock.

In the case of insulative and radiation reflective crystalline top coatings, it is important that they remain affixed to the base coat without any spalling off and that they do not melt down to a glassy and thus ineffective state. The selection of a bonding glass to use must be carefully made. Its function is to bond together particles of the refractory materials, to assist in bonding the coating as a whole to the base coat and to impart the desired expansion to the coating containing it.

In one installation, when an Inconel flame tube was internally coated with a ceramic base coat and a top coat 0.012-inch thick, the equilibrium temperature difference between its outer surface and that of an uncoated tube was about 70 F, when heating was carried on in a 1600 temperature range. On the other hand, the temperature lag or transient state temperature difference at 30 seconds was 154 F for this relatively heavy coating. This much difference can be of definite importance in cases where such things as projectiles are operating at temperatures near the melting point of the metal in their motive parts.

Coatings Fired at 1600 F—The firing temperature used for heat resistant enamels depends to a large extent on the maturing temperature of the coating. Many coatings for low carbon steel are fired around 1600 F. One good rule to follow is to fire at the minimum temperature at which maturing of the coating will be achieved within a practical time limit. In addition to incurring deformation of the metal by firing at unnecessarily high temperatures, excessive oxidation occurs which may cause copperheading and other metal oxidation defects.

In the case of alloy steels, higher enameling temperatures are required to produce adherence of the enamel to the metal. These alloys will generally permit the use of higher firing temperatures without danger of undue warpage. Firing temperatures in the neighborhood of 1800-1900 F are not uncommon when applying heat resistant enamel coatings to alloy steels.

High Temperature Paints—It is well known that heated metal emits radiations of various wave lengths. Even at low heat, long-wave infrared radiations are emitted. As the temperature of the metal increases to about 1100 F, the next shorter

nothing else can do what Microcarb does!

Microcarb is a control system for the carburizing process. It *continuously* measures something that nobody has ever measured before—the active carbon in a production furnace's atmosphere *while the furnace is at work in the heat-treat department.* And it automatically, continuously controls the surface carbon content of the steel on the basis of this measurement.

Microcarb is many things to many men, especially in defense work.

To top management, Microcarb means both higher product quality and lower unit cost! Also, it means that still another manufacturing operation comes under automatic control.

To production executives, Microcarb means closer following of manufacturing schedules, because carburizing speed and results are more predictable. More predictable, that is, even than with our own pre-Microcarb processing installations. And Microcarb helps heat-treaters apply their skill—helps them earn incentive pay.

To metallurgists, Microcarb means simply better carburizing. Perhaps you saw a recent magazine advertisement headed "Thank You, Leeds & Northrup!" in which Indiana Gear Works credits Microcarb as a "big help to the gear industry" and says

> "now, for the first time, we are able to control case carbon content on carburized parts"
>
> ". . . we can produce carburized surfaces with absolute uniform control and obtain absolute maximum hardness and maximum ductility"
>
> "no more retained austenite on wearing surfaces of high nickel steels"
>
> ". . . no more carbide networks in the hypereutectoid zone"

Such results trace back to the fact that with Microcarb the carbon you "set" is the carbon you get. Just as you set a temperature controller at 1700 F, if that is the carburizing temperature you want, so you set the Microcarb Controller at 90 if you want to carburize to ninety carbon. By making the proper setting, you can either protect the surface or add carbon. Instead of controlling the amount of carbon material supplied to the process, you actually control the amount that does the work. Can you imagine controlling the temperature of a furnace by just measuring the amount of fuel it gets, without a pyrometer to tell the temperature directly? Well, that's the kind of carbon control you have always had—until Microcarb. Microcarb measures and controls carbon directly, just as a pyrometer measures and controls temperature directly.

The "reason why" for Microcarb is its carbon-detecting element. This instrument, called a Carbohm, is an engineering rarity—a truly new device for sensing a change in its surroundings. Basically, it's a wire, made of an alloy which will either absorb carbon from the furnace atmosphere, or lose it to the atmosphere, until it and the atmosphere are in equilibrium, carbon-wise. With every change in the wire's carbon content, there's a change in its electrical resistance. This resistance is measured and translated into carbon percentage by the Microcarb recorder and controller.

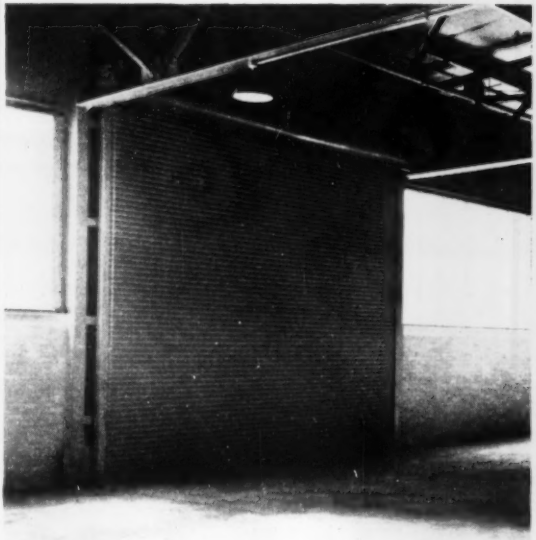
Only Homocarb Furnace equipments of our new Series H can be used with Microcarb Control, because engineering to meet the needs of atmosphere regulation is a necessity. Specific features are a soundly designed electric furnace with solid-bottom retort, improved fan housing and work support, and aerodynamically designed discharge jets; and Micromax temperature control of the duration-adjusting type specially designed for this service.

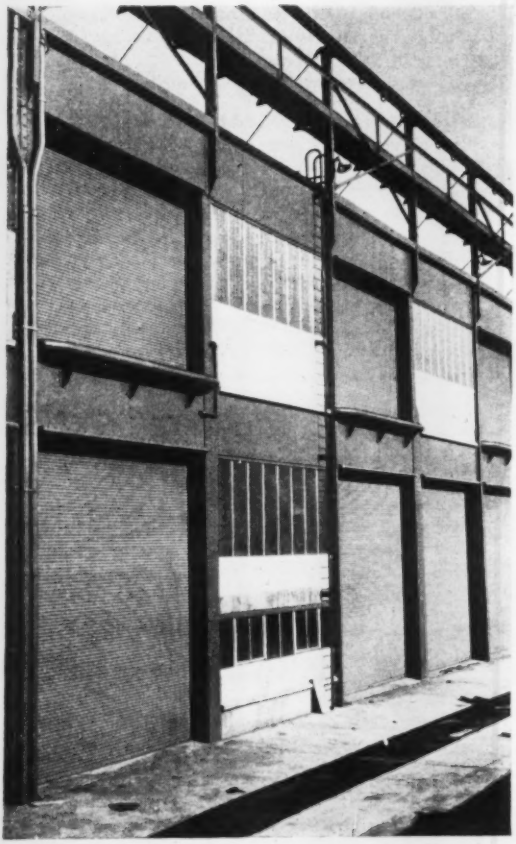
Let us send you further facts about this new Microcarb development. Ask our nearest office, or 4957 Stenton Ave., Phila. 44, Pa., for Catalog T-623.

LEEDS NORTHRUP

TD4-623(3)
August 13, 1951

one man opens these 1700-pound doors



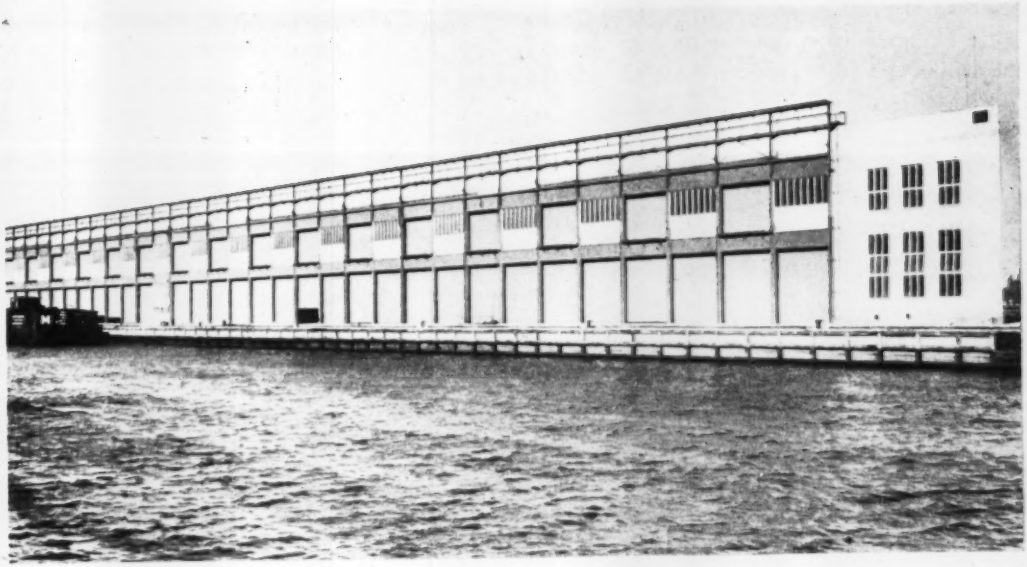


Pier 80, the Jackson Street Pier, is the newest commercial pier in Philadelphia. It's 994' long and 308' wide. This staunchly-built pier contains 146 steel rolling doors, counter-balanced by 292 torsion springs specially designed for this job by American Steel & Wire Company.

The doors are big (downstairs they're 22' wide, 18' high). The doors are heavy (1700 lbs.). One man must be able to operate them quickly, and they must be completely reliable in service.

The American Quality Springs are wound-up under terrific force when the doors are down, thus counter-balancing the tremendous weight. The springs are now in operation, and have given perfect service despite the large deflections. It's a typical tough job, easily solved with American Quality Springs.

American Steel & Wire Company makes springs of all sizes, ranging from locomotive and washing machine springs down to the tiny but reliable springs for cigarette lighters. So no matter what your problem, it will pay you to get the product-tested advice of our skilled spring engineers. Write to American Steel & Wire Company, Rockefeller Building, Cleveland 13, Ohio.



they're balanced with
AMERICAN QUALITY *Springs*

the spring's the thing

AMERICAN STEEL & WIRE COMPANY, GENERAL OFFICES: CLEVELAND, OHIO • COLUMBIA STEEL COMPANY, SAN FRANCISCO, PACIFIC COAST DISTRIBUTORS
TENNESSEE COAL, IRON & RAILROAD COMPANY, BIRMINGHAM, SOUTHERN DISTRIBUTORS • UNITED STATES STEEL EXPORT COMPANY, NEW YORK

USS

AMERICAN QUALITY SPRINGS

UNITED STATES STEEL

...Just to service lights?

PLANT ENGINEER: *%&S#*! We specified *hangers* . . . not hinges! We want to lower the lights, not the whole roof!

CONTRACTOR: Hangers? What kind of "hangers" bring lights down for servicing?

THOMPSON HANGERS! They lower lights to floor or ground level for safe, low-cost maintenance.

Well who climbs up to lower them? And what about fouled wiring and electrical hazards?

Listen! Full control is exercised from the floor. The fixtures are lowered by a chain or cable that's part of the installation, and the live contacts remain overhead.

Then how are they repositioned, and what holds 'em up?

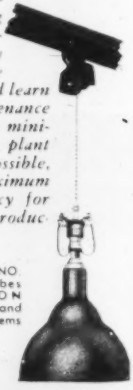
Repositioning is automatic because of the unit's design. Once raised, the light is held positively in place. It's safe and foolproof!

Sounds like a tricky operation. I'd like more details.

The whole operation can be accomplished in less time than it has taken me to tell you about it.

And you can get complete information from The Thompson Electric Co. Write for their new Catalog No. 50. You're in for a surprise, mister, on the hows and whys of efficient lighting fixture maintenance!

There's no obligation in requesting a Thompson Electric catalog. Why don't you write for one today, and learn how to cut maintenance costs to absolute minimum, make new plant safety records possible, and maintain maximum lighting efficiency for round-the-clock production operations?



CATALOG NO. 50 describes THOMPSON HANGERS and accessory items in detail.

172 TE

THE THOMPSON ELECTRIC CO.

1161 Power Avenue • Cleveland 14, Ohio

band of visible or glow radiations begins to appear. At a temperature of 1600 F, for example, steel glows brightly although most of the emitted energy is still to be found in the infrared band. In certain cases, as in the heated metal of exhaust stacks and collector rings of airplane power systems such radiations may reveal position. Because of these considerations an investigation of the radiation-suppressive properties of ceramic coatings has been carried out at the department of ceramic engineering, University of Illinois. An illustration shows the effectiveness of two high temperature ceramic paints in suppressing visible radiation which were developed in this work. In the case of coating No. CP 23, the radiation as compared with that of stainless steel at 1600 F, was less than 10 per cent. These coatings are applied by paint brush or by spraying over grease free metal and baked on by engine operation.

SOURCES

1. Ferro Enamel Corp., Cleveland, O.
2. Bennett, H. G., *Better Enameling* (Jan. 1951).
3. Harrison, W. N., Moore, D. G. & J. C., Richmond, *Finish* 3 (2): (1947); also *J. Research Nat. Bur. of Stand.*, Vol. 38 (Mar. 1947).
4. Chicago Vitreous Enamel Product Co., Cicero, Ill.
5. Harner, R. P., *Steel Processing* (June 1949).
6. Plankenhorn, W. J., *J. Am. Ceramic Soc.*, Vol. 31, No. 8 (June 1948).
7. A listing of some of the reports on heat-resisting enamels is given in *The Enamelist* Bulletin No. 1, (Mar. 1951).
8. Sweo, R. J., *The Enamelist* No. 1 (Mar. 1951).
9. Bennett, H. G., *J. Am. Ceramic Soc.*, Vol. 30, No. 10 (Oct. 1947).

Alcoa Making Giant Conductor

Largest, stranded electrical conductor ever supplied for an overhead transmission line is being manufactured by Aluminum Co. of America at its plant in Massena, N. Y. The conductor, 1.6-inch diameter expanded A.C.S.R. (aluminum cable steel reinforced), was purchased by Appalachian Electric Power Co. for the initial part of a 315-330 kv transmission system.

Expanded A.C.S.R. is designed to provide the large diameter required to minimize corona, with economy in the use of metal, and at the same time to maintain the customary relationship between strength and loaded weight of conductor. The expanded diameter of the concentric strand conductor is obtained by introducing nonmetallic strands of suitably treated fibrous material in the intermediate layers between the steel core and the outer layers of aluminum wires. Conductor is being shipped on 84-inch diameter steel reels, each containing 4500 feet of cable. The gross weight is 10,000 pounds per reel.

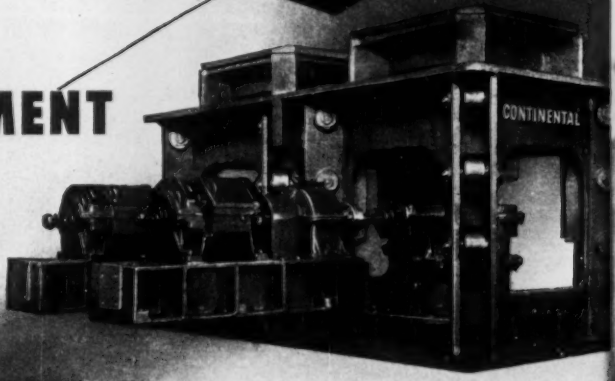
for AHEAD-OF-THE-FIELD engineering

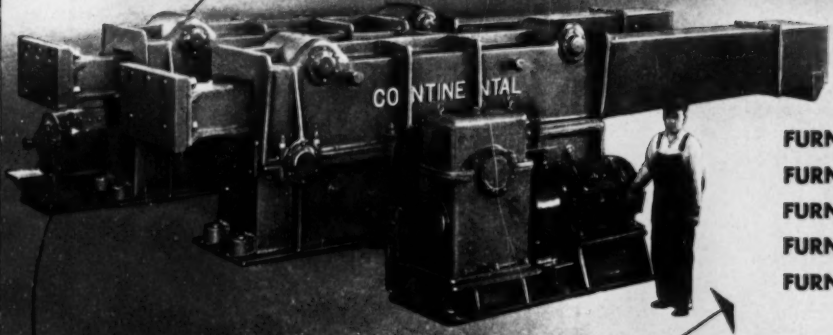
REHEATING

FURNACE EQUIPMENT

by

Continental





- FURNACE RUN-IN TABLES
- FURNACE RUN-OUT TABLES
- FURNACE PUSHERS
- FURNACE BUMPERS
- FURNACE DEPILERS

Continental

check first with

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FOUNDRY & MACHINE CO.

CHICAGO · PITTSBURGH

PLANTS AT:

EAST CHICAGO, IND.; WHEELING, W. VA.; PITTSBURGH, PA.

CASTINGS: Carbon and Alloy Steel; from 20 to 250,000 Pounds.
ROLLS: Iron, Alloy Iron and Steel; for All Types of Rolling Mills.
MILLS: Complete Installations of Rolling Mills and Auxiliary Equipment.

Something

in the way of

SPRING SERVICE

- **Free Publications** for the Engineer
  - "Handbook of Spring Design"
  - "The Mainspring," a periodical
  - "Handbook of Spring Steel"
- **Dependable Service** for the Purchasing Agent
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- **Ten Plants** for flexibility
- **Small Orders** always welcomed

THE BEST *ten* SOURCES FOR MECHANICAL SPRINGS

10

WALLACE BARNES COMPANY
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THE WALLACE BARNES COMPANY LTD.
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DIVISIONS OF
ASSOCIATED SPRING CORPORATION
AND CANADIAN AFFILIATE

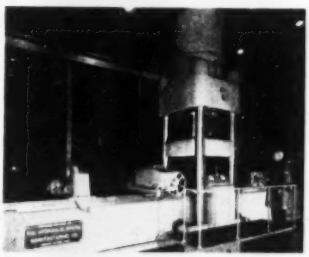
Speeds Possible Up to 5000 Mph

The working section of a wind tunnel for supersonic flight research for the National Research Council has recently been completed at the Lachine, Que., plant of Dominion Bridge Co. Ltd. Although the cross section of the tunnel, where the test models will be mounted, is only 10 inches square, the air speeds are high. The equipment works on the air suction principle whereby air is drawn through the tunnel working section to fill the void of a 35-foot diameter vacuum sphere.

Air enters the intake throat at the right hand end of the tunnel and is drawn through the nozzle box. Here the curving shapes of the roof and floor of the nozzle box form a venturi-like nozzle which determines the speed of air flow past the model. Nine nozzle boxes were provided, designed to be easily interchangeable, each having a different venturi-shape. Thus the air speed through the tunnel may have nine separate values, depending on which box is in use.

Box No. 1 is rated to give an air speed of Mach No. 1.4, which means a speed of 1.4 times the speed of sound. Boxes 2 to 6 are designed to give a progressive range of air speeds up to Mach No. 3.47. The venturi-shapes for the remaining boxes will be built by the National Research Council and it is estimated that with

Big Guns Get Straight Lines



PRESSURE can be applied to various sections of a forged gun barrel after the part is positioned on the bed of the 1500-ton straightening press shown under construction at Hydraulic Press Mfg. Co., Mt. Gilead, O. The press is on order for the Dixson Gun Plant in Houston operated by Hughes Gun Co. It is equipped with a 36 x 336-inch bed and the cylinder and ram assembly can travel a maximum distance of 204 inches. Fastraverse hydraulic power system allows the press to operate at high speed cycles with rapid advance to the work, automatic slow-down while pressure is applied and rapid return for the next cycle

FOR THE PROTECTION OF PROPANE STORAGE

AND — *Name Your Hazard!*

Industrial America is rapidly becoming fire-hazard conscious. Obsolete and inadequate systems of protection are being replaced by equipment which has clearly demonstrated its ability to protect.

Automatic FIRE-FOG, a leader among modern fire protection systems, provides instantaneous control and extinguishment of even the toughest fires. It's specifically designed for your particular risk—scientifically engineered so as to assure maximum protection for every area vulnerable to fire.

Fully approved by all leading insurance authorities, *Automatic* FIRE-FOG may be just the protection you've been seeking for the hot-spot area that is constantly threatening the continuity of your plant operations.

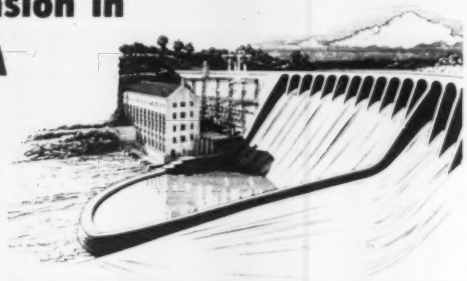
Get in touch with your nearest *Automatic Sprinkler* fire protection engineer for details on FIRE-FOG or other types of fire extinguishing systems. Name your hazard—we'll protect it!

"AUTOMATIC" SPRINKLER CORPORATION OF AMERICA
YOUNGSTOWN 1, OHIO

"Automatic" Sprinkler
FIRST IN FIRE PROTECTION
DEVELOPMENT • ENGINEERING • MANUFACTURE • INSTALLATION

OFFICES IN PRINCIPAL CITIES OF NORTH AND SOUTH AMERICA

Why ALABAMA POWER COMPANY is Spending $100,000,000 for Expansion in ALABAMA



Thomas W. Martin, Chairman of the Board of Alabama Power Company, recently announced a record-breaking three-year program of expansion of $100,000,000.

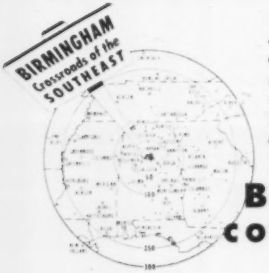
In a statement announcing the decision of the Company to spend this unprecedented sum for new construction, Chairman Martin said:

"No region in America has matched the Southeast's dynamic progress in the past two decades. The Southeast has outgained all sections of the nation in percentage of increase in per capita earnings and is now being generally acclaimed as the region of tomorrow's greatest opportunities for growth.

"Birmingham is the central city of the Southeastern States. It has outstanding manufacturing and distributing advantages for companies that are decentralizing, manufacturers that are broadening production, and firms which wish to put sales offices in the center of the growing Southeast consumer market. Among these are abundant raw materials and labor, a web of transportation facilities, low-cost fuels and power, and a most reasonable tax rate.

"Birmingham and Alabama have experienced their greatest industrial development in the postwar period. Studies made by our Company forecast continuation and acceleration of this progress in the period ahead. This is why we estimate the expenditure of more than $100,000,000 over a three-year period for expansion of our Company's facilities in Alabama."

* * * * * * * *



The Committee of 100 or any of the undersigned members of the Executive Committee will welcome the opportunity to give you confidential and specific data regarding the advantages of the Birmingham district for your plant, office or warehouse.

BIRMINGHAM COMMITTEE OF 100

Executive Committee

Gordon Persons, Governor, State of Alabama
Bradford C. Colcord, President, Woodward Iron Co.
John S. Coleman, President, Birmingham Trust, National Bank
Donald Comer, Chairman of the Board, Avondale Mills
William P. Engel, President, Engel Companies
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Thomas W. Martin, Chairman of the Board, Alabama Power Co.
J. C. Persons, President, First National Bank
O. W. Schanbacher, President, Loveman, Joseph & Loeb
A. V. Wiebel, President, Tennessee Coal, Iron & Railroad Co.

them, air speed equivalent to 5000 miles per hour at sea level will be reached.

The left hand end of the nozzle box projects into the balance box, where the model is mounted, and which contains the apparatus for measuring the wind effects on the model. Both nozzle boxes and balance box have optical glass windows, 1¼-inches thick, through which shock waves, boundary layers and other flow phenomena can be observed and photographed by means of a schlieren apparatus.

When the nozzle box is removed, the balance box is capable of being moved forward to allow easy access for mounting the model and adjusting balance apparatus.

Air leaving the balance box flows through the adjustable throat section. Here the roof and floor of the tunnel consist of flexible aluminum plates, capable of being flexed by a system of screw jacks to give varying tunnel heights, ranging from 12.5 to 6.25 inches. The purpose of this device is to provide means of pressure adjustment inside the balance box and to increase the efficiency of pressure recovery.

Connected to the adjustable throat is a transition piece which smoothly transforms the tunnel cross section from a rectangle to a circle. A 15-inch diameter globe valve, built by Dominion Engineering Works Ltd. will be bolted to the transition piece from which a conical diffuser leads to the vacuum sphere.

Solvents Extracted Readily

Dow Chemical Co., Midland, Mich., announces the development of a process for the extraction of aromatic concentrates for aviation gasoline, benzene, toluene and xylenes from petroleum.

The process, designated UDEX, was developed in co-operation with Universal Oil Products Co., Chicago, who will act as its licensing agents to the petroleum and petro-chemical industries.

According to Dow the process effects a substantially complete separation of the aromatics so necessary for the production of synthetic rubber, explosives and other products essential to the military and civilian economy. The recovery of these aromatics from wide-boiling petroleum naphthas is exceptionally high, and the product can be separated by distillation to produce benzene and toluene of high quality.

Used in conjunction with a catalytic reforming process, it can be employed to extract maximum quantities of aromatics from reformed naphthas. It has been found to be particularly

JOHNSON'S WAX LUBRICANTS perform "impossible" draws!

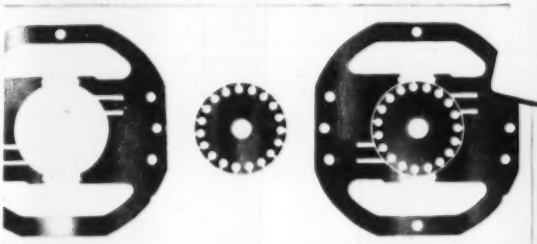
Because of their ability to "stay with" the metal on which they are applied, Johnson's Wax Lubricants for drawing and forming metal offer results unobtainable with conventional lubricants.

Under high heat and pressure conditions they permit unhampered flow of the metal during the draw to produce smooth, gall-free surfaces and perfect angles, corners and curves.

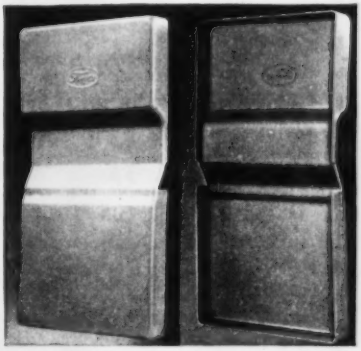
Johnson's Wax Lubricants are unmatched for drawing, stretch forming, bending, reducing, swaging, coining and lamination stamping. *We can prove it on your job.*

Get these benefits now!

- Multiple draws without reapplication
- Far greater die life
- Excellent results on deep, hot, difficult draws
- Suitable for nearly any draw in the shop
- Easy application by conventional methods
- Clean, safer machine and shop surroundings
- Reduced press pressures—increased pad pressures where desired
- Substantial cost savings

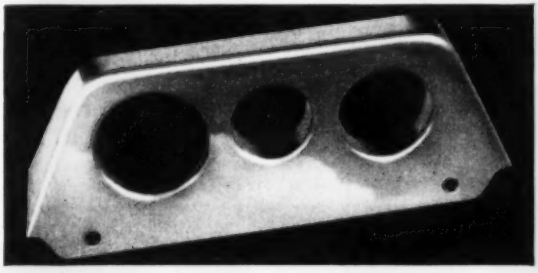


Above, Johnson's Wax Lubricant used for lamination stamping increased sets per die grind from 45,000 to 65,000.



Right, Car radio case of hot rolled steel—impossible to draw with common lubricants—perfect consecutive draws with Johnson's Wax Lubricant.

Below, Telephone coin receptacle of No. 405 stainless steel drawn with Johnson's Wax Lubricant. No perceptible tool wear after thousands of successive perfect draws.



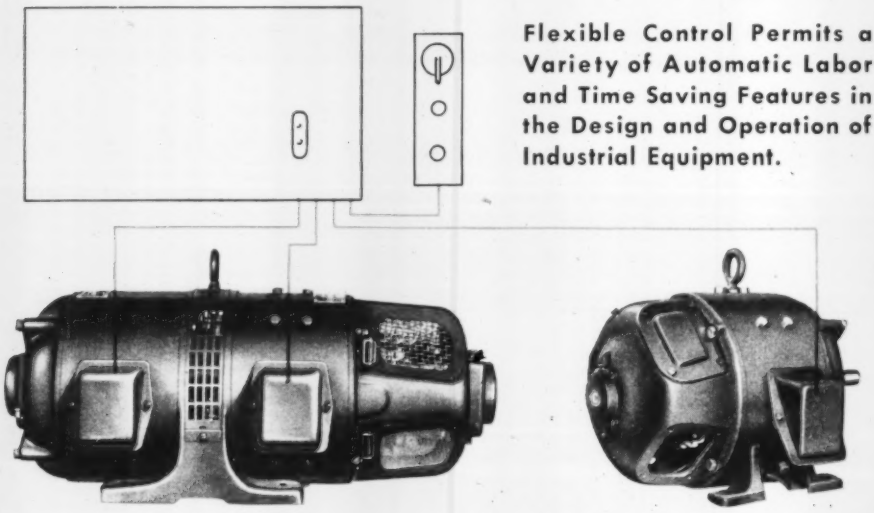
Write for complete information concerning the use of Johnson's Wax Lubricants for your particular job.

S. C. JOHNSON & SON, INC.
Industrial Products Dept. S-8
Racine, Wisconsin

Century SELECTIVE SPEED Drives

For Operation From Alternating Current to Save Time and Labor

Flexible Control Over a Wide Range of Stable Production Speeds



Flexible Control Permits a Variety of Automatic Labor and Time Saving Features in the Design and Operation of Industrial Equipment.

All or any combination of the following features may be specified with Century SELECTIVE SPEED Drives

1. **WIDE RANGE AND SPEED VARIATION** — 8 to 1 ratio is a standard — 16 to 1 or 32 to 1 is available.
2. **PRACTICALLY STEPLESS CONTROL** — Smooth acceleration and deceleration for any character of load.
3. **STABLE SPEEDS** — Even with varying loads.
4. **JOGGING CONTROL** — Jogging at preset speed is always available.
5. **PRESET SPEED CONTROL** — Automatically accelerates to speed preset by the control.
6. **DYNAMIC BRAKING** — For quick, automatic stopping or where controlled deceleration of load is required.
7. **REVERSING OPERATION** — Jog in reverse, or run in reverse, or both as specified.
8. **MULTIPLE DRIVING UNITS** — With related speeds controlled from a single control.
9. **CONTROL LOCATION** — "Start" — "Stop" — "Jog" — "Reverse" or change in speed may be controlled from any number of locations.
10. **TYPES OF REMOTE CONTROL** — Variety of control accessories may be incorporated into the functional design of your equipment to provide automatic time and labor-saving features.

Century SELECTIVE SPEED Drives are manufactured in sizes from 1 to 150 horsepower.

Call a Century motor specialist who will help you analyze your motor application problems.

Century manufactures a complete line of alternating current, single and polyphase and direct current motors and generators, 1/6 to 400 horsepower — 500 Watts to 300 KW. Popular types and standard ratings are generally available from factory and branch office stocks.

Century C MOTORS

CENTURY ELECTRIC COMPANY • 1806 Pine St., St. Louis 3, Missouri

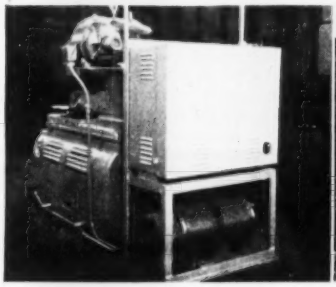
Century Electric Company is celebrating its 50th year in the electrical industry

Century SELECTIVE SPEED Drives

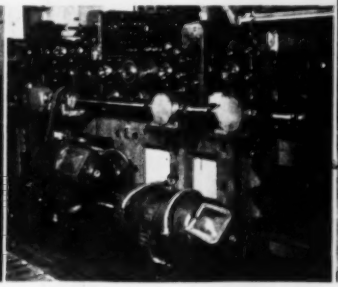
Permit Exact Speed Control for Increased Production • Better Quality Control

Here are a few typical applications

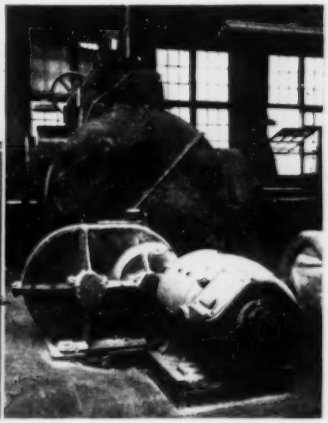
that demonstrate the benefits which you can get from Century Selective Speed Drives on either new equipment or your present set-up.



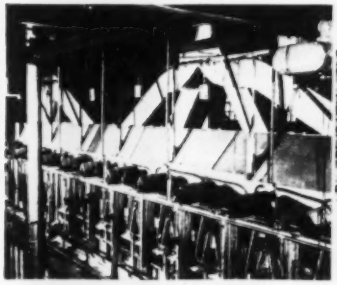
Production increased, machining quality was improved, accuracy is held closer and set-up time is reduced as a result of achieving optimum peripheral cutting speeds on this boring mill.



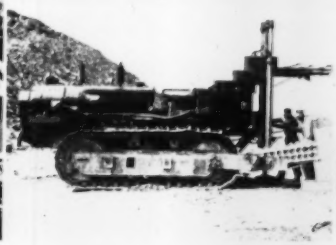
Costs are cut and scrap is reduced because maximum speeds are easily controlled for different classes of work done on this printing press. Accurate control maintains exact register of multiple copy forms.



Better quality control is maintained over production of latex threads because of the wide selection of speeds plus smooth acceleration and deceleration. Extreme flexibility permits fast change-over when a new gauge, or size, of rubber thread is to be produced. Instant stopping is also an important protective feature.



Uncoilers and coilers with pinch rolls and looping device, require a wide range of inter-related automatic sensitive speed changes. As the coils of material unwind from one spool and wind on another spool, the diameters change yet the speed through the electrolytic process must be at a constant rate.



Operating speeds are instantly controlled on this earth auger drill rig. Permits operator to change speeds according to the type of earth being drilled. Drilling is done to depths of 100 feet in strip mining.

For more details on Century Selective Speed Drives, from 1 to 150 horsepower, call the Century office nearest you. Your local Century representative can also furnish information on the complete line of Century motors, from ⅙ to 400 horsepower.

CENTURY ELECTRIC CO.

1806 Pine St. • St. Louis 3, Missouri

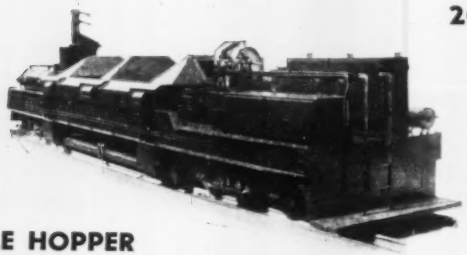
Offices and Stock Points in Principal Cities

Century Electric Company is celebrating its 50th year in the electrical industry

ATLAS CARS

TO MEET SPECIFIC TRANSFER PROBLEMS

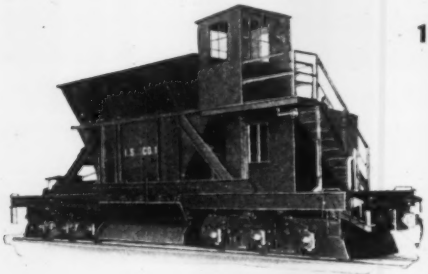
20-TON



DOUBLE HOPPER
BOTTOM DUMP SCALE CAR

120-TON

SIDE DUMP



ORE TRANSFER CAR

ATLAS BUILDS:—Scale Charging Cars and Ore Transfers: Indicating and Recording Dials for weighing scales: Electric and Storage Battery Locomotives: Coal Charging Cars: Door Extractors: Coke Quenching Cars: Turntables.

ATLAS ENGINEERING SERVICE
IS ALWAYS AT YOUR SERVICE

THE ATLAS CAR & MFG. CO.

ENGINEERS MANUFACTURERS

1732 IVANHOE RD. CLEVELAND 10, OHIO, U. S. A.

effective when used with Universal's Platforming process, and the combined Platformer-UDEX unit is singularly practical from an operating economy standpoint.

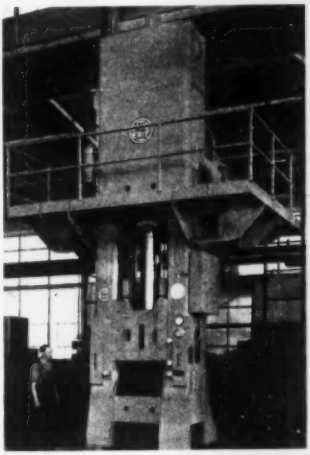
Radiant Oven Speeds Drying

Drying of tractor parts has been improved by changing from manually directed hot air blast to a controlled electric infrared oven at Harry Ferguson Inc., Detroit. The new conveyorized setup automatically dries widely varying part sizes and shapes for paint spraying, resulting in substantial savings.

Each of the two oven halves contains 14 Chromalox electric radiant heaters on a 230 volt line, six vertical units rated at 2.5 kw each and eight horizontal units rated at 1.8 kw each. The latter are spaced so as to concentrate more heat in the area through which the heaviest sections of metal pass. A power blower located behind the vertical heaters drives high velocity air through the oven.

Parts are conveyed through the 8-

Ready To Make Steel Cartridges



FORERUNNER of a variety of presses to be used in the armed services steel cartridge case program is this 200-ton hydraulic press made by Lake Erie Engineering Corp., Buffalo. It will be used to produce 105 mm cartridge cases, performing the first draw. Press has a bed area of 30 x 30 inches, daylight opening of 66 inches and a 48-inch stroke. Powered by a 125 hp motor, the press stands 22 feet above the floor. Together with 17 other presses made by the company, it is being installed at Ekco Products Co., Chicago

FINE-EDGE CUTTERS

Want high

Edge Strength?

You can get it

with DBL-2 HIGH-SPEED STEEL

Write for copy of

"CUTTING TOOL MATERIALS"

Allegheny Ludlum produces *all* types: the various tungsten and "moly" high-speed steels, cast-alloy materials, and cemented carbides. This 36-page booklet analyzes and compares types, and covers grade selection, etc.—invaluable data for production men. *Write for your copy.*

ADDRESS DEPT. S-20

A midwestern tool manufacturer, specializing in fine-edge cutting tools, has found DBL-2 *best* for their purpose—added proof of the high edge strength and excellent cutting qualities of this high-speed steel.

DBL-2 (typical analysis: C .80, W 6.00, Mo 5.00, Cr 4.00, V 1.75) represents the 6-6-2 or M-2 type of tungsten-molybdenum high-speed steel. DBL-2 combines high hardness with toughness. Requiring no more than reasonable care in hardening and tempering, you will find it a high-speed steel of great possibilities—capable of giving you performance equal to, or better than, the general-purpose tungsten types, and at reduced cost.

DBL-2 reliability has been proved in a wide variety of cutting tools. Let us help you to use DBL-2 . . . our Mill Service Staff is at your command.

● *Allegheny Ludlum Steel Corporation, Henry W. Oliver Bldg., Pittsburgh 22, Pa.*

For complete **MODERN** Tooling, call

Allegheny Ludlum

W&O 363-F

AL FINE TOOL STEELS SINCE 1854

Holding the KEY to

TOUGH Bending Problems

Experienced manpower and modern methods combine to solve even the most difficult bending problems at King Fifth Wheel.

Perhaps we haven't encountered your particular problem before (chances are we have, because we've heard about most of them since 1904) but we'll make it our business to give you a prompt, helpful answer • Remember this: the key to tough bending problems is *experience.* We've got lots of it and, frankly, we don't know anv substitute.

If you'd like a catalog, capacity charts or a representative to call; phone, wire or write Department SA-51.

King **FIFTH WHEEL COMPANY**
2915 N. 2ND ST., PHILADELPHIA 33, PA., NE 4-2444

foot oven at a rate of 25 feet per minute, and the parts temperature is raised well above boiling point in the 20-second exposure time. The parts leave the oven and cool in the 50-foot travel to the paint booth. To accommodate the fuel tank which has soldered joints the heaters are equipped with variable heat control. Heat is applied at the highest intensity possible without softening the soldered joints.

Bowser Tells Its Story

Since Bowser Inc., Ft. Wayne, Ind., and its 14 wholly owned subsidiaries in the U. S. and Canada manufacture a diversified line of products, the company has some difficulty in explaining the complete field it covers through normal advertising channels. To circumvent this difficulty a folder is being made available entitled, "1001 Ways Bowser and Its Subsidiaries Serve You Every Day."

Brief descriptions are given of liquid control systems made by the parent company plus a variety of items such as: Fare boxes, locks, fasteners, automotive and aviation test equipment, incinerators and builders' hardware made by the subsidiary companies. Almost 100 product groups are mentioned showing the diverse fields served by the 66-year old company.

Sintered Carbide Data Issued

A technical data publication covering the use of sintered carbide in blanking dies is issued by Firth Sterling Steel & Carbide Corp. Title of the 16-page booklet is "Diecarb — Grades, Applications, Design and Maintenance." It is available to die designers and fabricators, manufacturers and users of industrial presses for blanking, coining and perforating.

The die designer will find in this booklet useful Diecarb grade selection information and formulas for computing the physical requirements of sintered carbides used for die sections. Standard sections are established through the co-operation of leading tool and diemakers and company engineers. The standards are listed for punches, perforators, bushings and rectangular sections. Write Firth Sterling Steel & Carbide Corp. Dept. S, 3113 Forbes St., Pittsburgh 30.

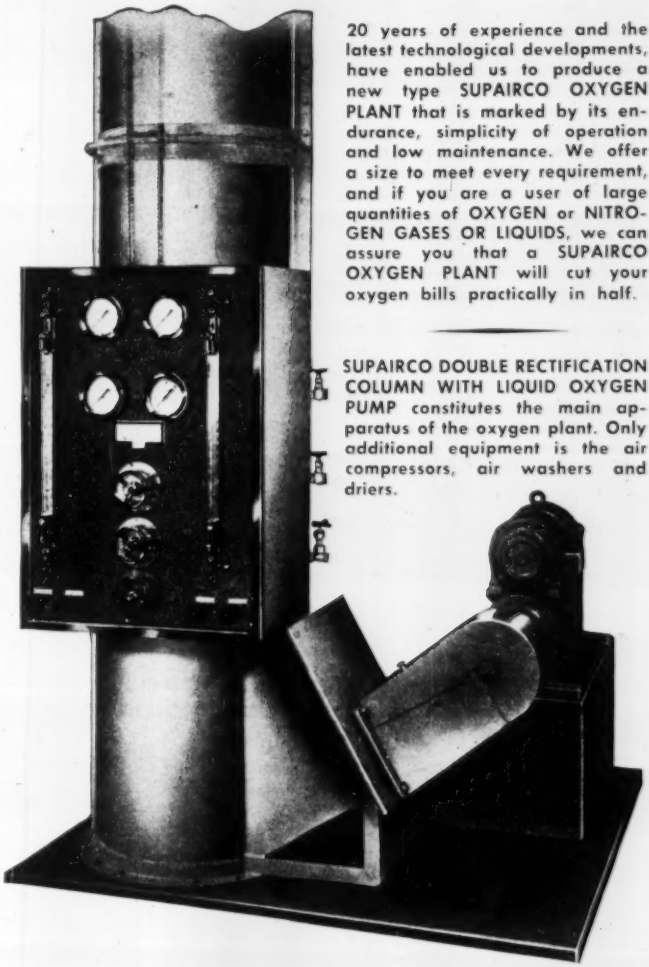
Alternate Tubing Steels Detailed

Assistance in solving problems involving the use of alternate grades of medium carbon, or full hardening, grades of tubing steels, is offered in a new four-page bulletin published by the Babcock & Wilcox Tube Co. Known as bulletin TDC 141, it pre-

SUPAIRCO

Oxygen FROM AIR

at Lowest Costs to You



20 years of experience and the latest technological developments, have enabled us to produce a new type SUPAIRCO OXYGEN PLANT that is marked by its endurance, simplicity of operation and low maintenance. We offer a size to meet every requirement, and if you are a user of large quantities of OXYGEN or NITROGEN GASES OR LIQUIDS, we can assure you that a SUPAIRCO OXYGEN PLANT will cut your oxygen bills practically in half.

SUPAIRCO DOUBLE RECTIFICATION COLUMN WITH LIQUID OXYGEN PUMP constitutes the main apparatus of the oxygen plant. Only additional equipment is the air compressors, air washers and driers.

SUPERIOR AIR PRODUCTS CO.

128 MALVERN STREET • NEWARK 5, N. J., U. S. A.

Also Manufacturers of Plants and Apparatus for Liquid Air, Liquid Oxygen, Liquid Nitrogen and Containers and Flasks for Liquefied Gases.

MISSION for Mass Production

Forming tank halves on a Clearing press at Lockheed.

To extend the range of jet fighters, wing fuel tanks have been developed to be dropped when empty. Two tanks are lost on every flight, so quantity production at low cost is imperative. Lockheed Aircraft Corporation turned to Clearing for a special hydraulic press to solve this problem. These expendable tanks are now being produced as required.

Providing the means to produce large quantities of metal items at low unit cost has been Clearing's chief concern since the company was founded. Parts even larger than shown here, and other parts tiny by comparison, are being turned out economically on Clearing presses today. It will pay you to consult Clearing with your problems.

CLEARING MACHINE CORPORATION
6499 WEST 65TH STREET ★ CHICAGO 38, ILLINOIS

sents condensed data on microstructure, critical points, effect of alloy elements, forging, machining, welding and thermal treatment for 14 well known alloy steels used in the production of tubular parts. Copies are available free on request to the company's offices located at Beaver Falls, Pa.

Alloying Controls Get Better

Rapid and accurate analyses of the elements in brass and bronze alloys are achieved with the Quantometer, a direct reading spectrometer installed by Titan Metal Mfg. Co., Bellefonte, Pa. In co-operation with Applied Research Laboratories, Glendale, Calif., Titan is the first brass mill to adapt and install the device for the selection of raw materials prior to and after alloying in the production control of brass and bronze products.

When using the Quantometer, the alloy sample is sparked and the light from a single selected spectral line cast by each element is converted from light energy to electrical energy by means of electronic tubes. This charge activates a recorder which indicates the percentage of each element in the sample. As many as eight elements present even in minute quantities of only 0.002 per cent can be analyzed accurately in two minutes. This equipment replaces the previous chemical methods of analysis, which required longer periods of time and were subject to some human error.

Airless Blasting Does the Trick

Surface preparation of steel parts before rubberizing is an operation at Reeves Rubber Inc., San Clemente, Calif., that has been speeded up to effect a worthwhile cost saving. A matte finish is put on these parts so that a good bond between the metal and rubber will result. Most of the production is for the automotive industry.

Company formerly etched the metal surfaces by means of airblasting with sand. It was such a slow operation that with one man on each shift keeping the airblast cabinet operating around the clock, Reeves was able to process only enough metal to meet one customer's requirement.

Engineers of American Wheelabrator & Equipment Corp., Mishawaka, Ind., recommended an airless blasting machine with a 2-cubic foot capacity for this work. An operator loads work into the barrel of this machine, and an endless apron-type work conveyor continually draws pieces up from the bottom of the

STEEL

THE VEHICLE OF DEFENSE

Without steel there would be little or no movement of men and material . . . there would be little or no defense.

For steel is the stuff of which tanks are made . . . in the hands of trained and spirited men, steel becomes a powerful engine of destruction to the enemies of free America.

Thousands upon thousands of tanks and a proportionate number of tank retrievers are now needed and are on order. The country's rolling mills and forges have the go-ahead to produce the many special steels required for these specialized vehicles.

Weirton Steel Company, pledged to participate in defense measures in any way and to any required degree, is supplying steel on approved allocation to hasten the completion of America's mechanized defense program.

WEIRTON STEEL COMPANY

WEIRTON, WEST VIRGINIA

NATIONAL STEEL CORPORATION

NATIONAL STEEL

Castings ground smooth in single-step operation

Aluminum canopy beams for Lockheed fighters finished 100% faster with new 3M Backstand Method of grinding

Linmold Company, Compton, California, reports the 3M Backstand Method has eliminated one entire grinding operation. Flash and gates on aluminum castings are now cut close with a metal saw—then ground smooth in a single step. Snagging wheels and set-up wheels are no longer needed. Grinding time is cut in half!

The 3M Backstand Method and 3M Abrasive Belts can cut finishing costs in your plant, too. And standard grinding and polishing equipment is easily and quickly converted to the new system.

Write Dept. 8-851 for your copy of "Step Up Production" book explaining this cost-cutting method. Use coupon below.

Minnesota Mining & Mfg. Co.
Dept. FO-451, St. Paul 6, Minn.
Please send me copy of "Step Up Production" booklet.

Name.....

Company.....

Address.....

City.....State.....

Made in U.S.A. by MINNESOTA MINING & MFG. CO., St. Paul 6, Minn., also makers of "Scotch" Brand Pressure-sensitive Tapes, "Scotch" Sound Recording Tape, "Underseal" Rubberized Coating, "Scotch-lite" Reflective Sheeting, "Safety-Walk" Non-Slip Surfacing, "3M" Adhesives. General Export: Durex Abrasives Corp., New Rochelle, N.Y. In Canada: Minnesota Mining & Manufacturing of Canada, Ltd., London, Canada.

load and gently cascades them over the top of the load where they are subjected to the full and concentrated blast of metallic abrasive. This abrasive is centrifugally hurled at the work by a rotating wheel and all pieces in the load are exposed to the same amount of cleaning action.

Enough metal parts to take care of the entire daily production for several customers are processed now in 3 hours, with the services of one man part time. While the machine is cleaning a load of parts, the operator is not needed, so he performs a degreasing operation on other parts to make them ready for the blasting operation.

This means that 50 per cent of the man's time can be charged to the blasting operation, and the labor cost for blasting is now 94 per cent less than it formerly was. Present maintenance and repair costs are considerably lower than they formerly were, since there are no hoses or nozzles to replace.

Mineral Wool Forms Blanket

Insulation of turbines requires an efficient insulating material that can be easily applied to irregular, hard-to-get-at surfaces. In addition, temperatures in different zones of a turbine vary considerably, and it is most economical to use an insulator whose thickness can be conveniently changed according to surface temperature. Because it fulfilled both these requirements, engineers specified mineral wool insulating cement on turbines driving the 60,000-kw generators at the Barbadoes Island generating station of the Philadelphia Electric Co.

Mineral wool cement is applied to the turbine in two layers with 1-inch wire mesh secured by tie-wires over the first layer as additional support and as a key for application of the second layer. The 16-gage copper-weld tie-wires are twisted through ¼-inch nuts welded to the turbine surface on about 12-inch centers. Asbestos cloth is wrapped and tied around the large bolts to facilitate later removal of the top section of the turbine for internal maintenance.

First coat of mineral wool cement (3 inches thick) is next trowelled smoothly over the surface and around the cloth-covered bolts. The tie wires protrude from the wet cement.

Second layer is trowelled into wire mesh and allowed to dry thoroughly. The thickness of the second layer varies from 1 to 3 inches, according to the surface temperatures on particular sections of the turbine. In the highest temperature zone, the

PRESSING ...

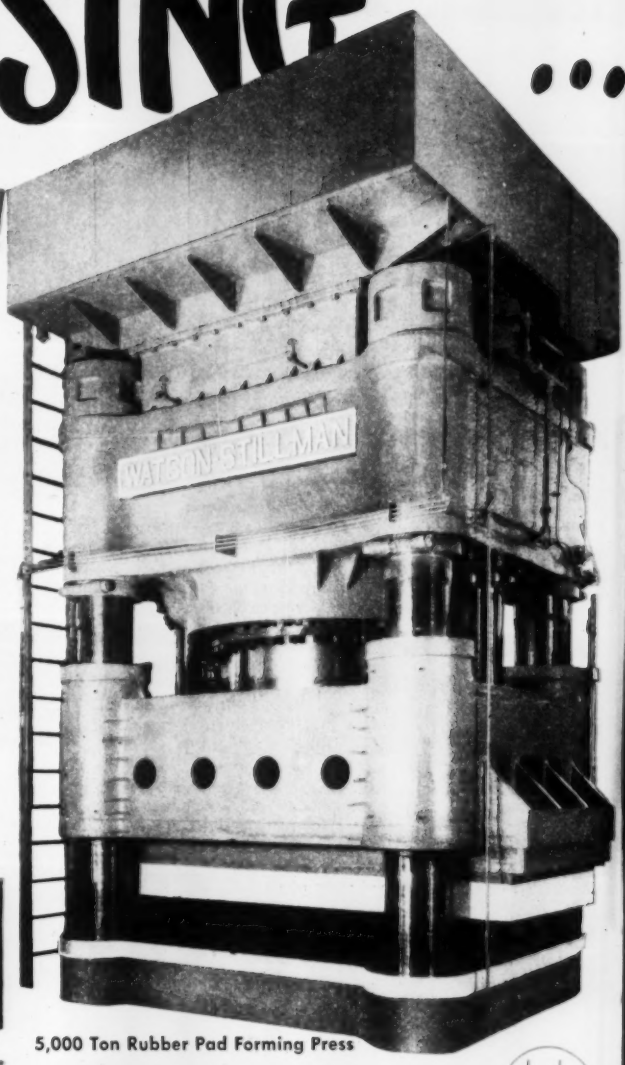
out the ARMS for UNCLE SAM!

Planes . . . tanks . . . guns . . . shells . . . shell cases or any one of a thousand and one other items that must be produced, as long as it can be pressed out of metal, there's a W-S Press to do the job . . . and more economically, too.

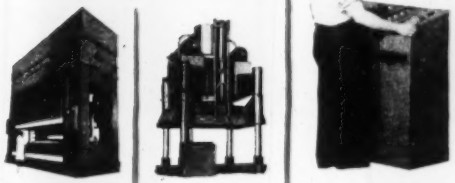
W-S Medium and Deep Draw Presses do things faster. Rejects are virtually eliminated . . . present dies and materials can be used . . . one or more draws may be cut from a progressive operation, thereby saving man hours on the job . . . intermediate annealing is often reduced or eliminated and total production time cut down.

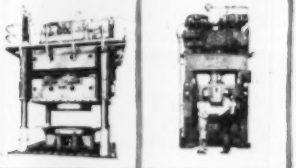
Designed for precision work and built for long service, these W-S Hydraulic Presses offer further advantages in set-up, maintenance and tool life. Available in a large choice of pumping units and controls. It will pay you to investigate their flexibility.

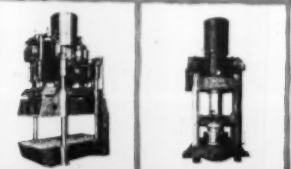
Other W-S Metal Working Presses include those for Forming, Flanging, Trimming, Forging, Coining, Hobbing, Extruding, Briquetting, Bending and Straightening.



5,000 Ton Rubber Pad Forming Press







HYDRAULIC MACHINERY DIVISION

WATSON-STILLMAN Established 1848

Factory and Main Office: 167 Aldene Rd., Roselle, New Jersey

Branch Office: 228 No. La Salle St., Chicago, Illinois

REPRESENTATIVES

Birmingham 3, Ala. . . . . George M. Meriwether
Dallas, Tex. . . . . M & R Sales Co.
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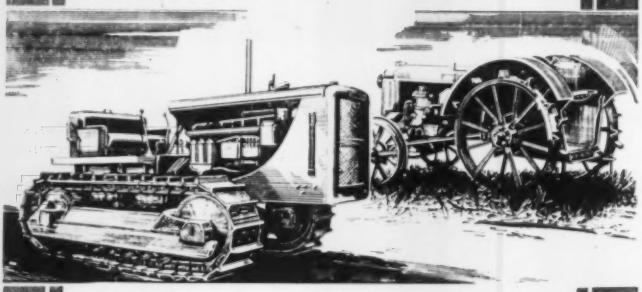
Indianapolis 20, Ind. . W. K. Millholland Mach. Co.
Los Angeles 11, Cal. . . . . H. M. Royal, Inc.
Pittsburgh 19, Pa. . . . . Stanley Berg & Co.
Portland, Ore. . . . . Machinery & Tool Supply Co.
Rochester 12, N. Y. . . . . Watson-Stillman Co.
San Francisco 7, Cal. . Schellenbach Mach. Tool Co.
Seattle, Wash. . . . Machinery & Tool Supply Co.
Spokane 8, Wash. . Machinery & Tool Supply Co.
St. Paul 4, Minn. . . . Anderson Machine Tool Co.

Manufactured in Canada by—CANADIAN VICKERS, Ltd., Montreal

W-S "COMPLETELINE" HYDRAULICS . . . THE SHORTEST DISTANCE FROM PRODUCTION TO PROFITS

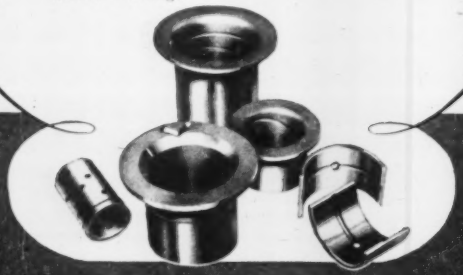
9-L-17

JOHNSON BEARINGS
1901-1951



Machinery and Bearings Both do a Better Job Today

THE MECHANIZATION of the farm of 1951 demonstrates the tremendous strides made in equipment improvement in fifty years. Combines, tractors, electrified machinery and appliances do more work and are more efficient than ever before. Similar progress in sleeve bearings has been made by Johnson Bronze during this time . . . new bearing styles, refinement of bearing alloys, greater precision and closer tolerances. Johnson Thin Wall Bearings, Ledaloyl Self-Lubricating Bearings, and Johnson Aluminum Alloy Bearings now replace the old style bearings of earlier days. Much of this farm equipment is able to out-perform and out-wear earlier models simply because of new and improved Johnson Bearings. For satisfactory performance specify Johnson Sleeve Bearings.



SLEEVE BEARING HEADQUARTERS *Since* 1901

Johnson Bronze

550 SOUTH MILL STREET · NEW CASTLE, PA.

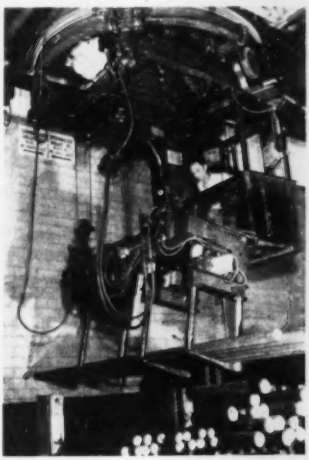
second layer is 3 inches thick to provide a total of 6 inches of mineral wool cement. Bolts are completely covered to form a smooth, unbroken Btu-barrier.

To reach the bolts for maintenance of the turbine, it is only necessary to chip away the mineral wool cement around the bolts and remove the cloth covers. The nuts are then taken off and the top of the turbine lifted. When maintenance is completed, the turbine top is bolted back into place and the bolts reinsulated with a small amount of mineral wool cement. The major portion of the insulation jacket on the turbine remains intact with no damage. After insulation is completed, a steel housing is installed over the turbine.

Galvanic Corrosion Eliminated

Cathodic Protection Division, Harco Corp., Cleveland, announces installation of its system to eliminate electrolytic corrosion in open-type condenser boxes of No. 1 refinery of

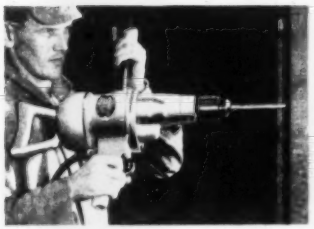
Bar Handling Is Its Specialty



HANDLING about 4.5 million pounds of bar stock annually in General Electric Co.'s Small and Medium Motor Division's manufacturing operations at Lynn, Mass., this specially built crane saves $15,000 per year over the old handling method. Main element of the 3-ton, double bridge, monorail is the grab, a steel frame suspended by pulley and cable and equipped with three movable forks and safety prongs. Flexibility of the arrangement provides quick efficient and selective handling of stock consisting of 12 shapes, 75 specifications and 800 sizes

VAN DORN POWER

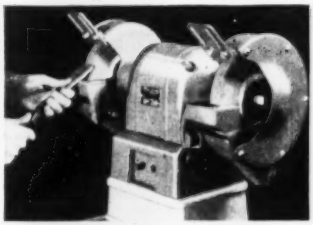
Solves Tooling Problems!



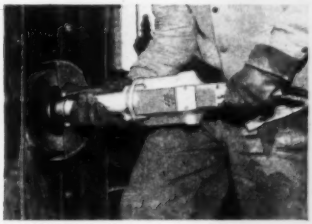
Drilling: Choose from 25 Van Dorn Drills with capacities from ¼" to 1¼" in steel, double in hardwood. Choice of power, speeds, handles for efficient operation.

Sanding: Versatile Van Dorn Sanders drive abrasive discs, saucer grinding wheels, wire cup brushes, planer heads. Four models, 7" and 9" disc diams., to suit your needs.

Whether your problem is drilling, sanding, grinding or screw driving —whether it involves production, maintenance or construction—you name the job and there's a Van Dorn Tool to help you do it better, faster, with fewer man-hours, at lower cost! Check the Van Dorn Tools shown on this page—just a sample of over 100 in the complete Van Dorn Line. Then see your nearby Van Dorn Distributor for a demonstration of any of them—plus full details on how their easy handling, powerful performance, quality construction can help you solve tooling problems! WRITE TODAY for free catalog to: THE VAN DORN ELECTRIC TOOL CO., 720 Joppa Rd., Towson 4, Md.



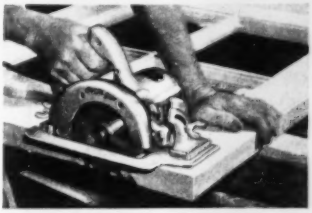
Grinding: Van Dorn Bench Grinders speed tool sharpening, grinding, wire brushing, buffing. Four models, 6" to 10" wheel diams., ¼ to 1 h.p. constant-speed motors.



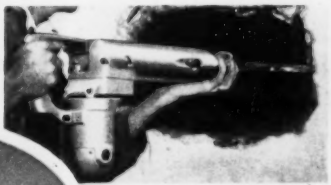
Grinding: Van Dorn Portable Grinders bring the tool to the work when it is too heavy or bulky to move. Four models, 3" to 6" wheel diams. Perfectly balanced.

Shearing: Van Dorn Porto-Shears* cut ferrous and non-ferrous sheet, galvanized, stainless, etc., fast and accurately. Easy to follow guide line because cutting action is always visible. 12, 16, 18 gage models.

Screw Driving: 25 Van Dorn Screw Drivers drive anything from tiny screws to nuts and bolts up to 1" diam. Models with either positive or adjustable clutches. 90° Angle Head models for easy handling in close quarters.



Sawing: Van Dorn Quick-Saws* are ten times faster than hand sawing. Rip or crosscut, cut angles, grooves, bevels. Two models for cutting to max. depths of 2 7/16" and 3¼".



Hammering: Van Dorn Electric Hammers drive star drills, bull points, chisels; for drilling, channeling, chipping, scaling, demolition, in concrete, stone, brick, metal, wood. Four models (rated for capacity in concrete): ½" to 2".

For Power Specify "Van Dorn"

Portable Electric TOOLS

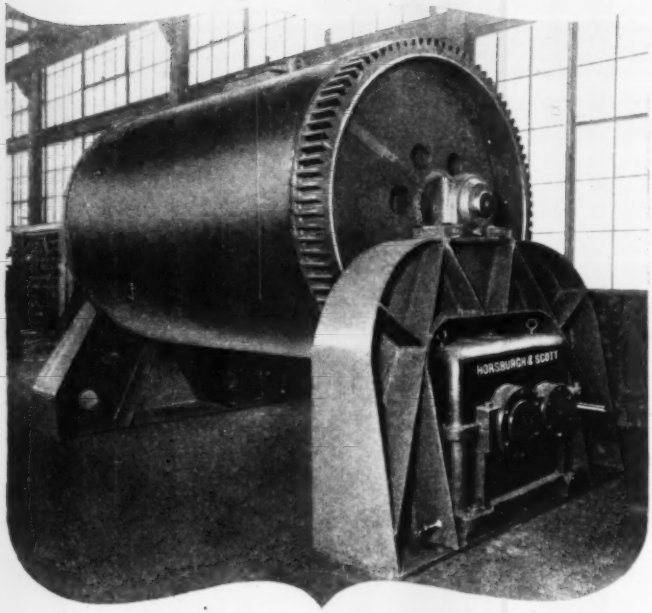
(Div. of Black & Decker Mfg. Co.)

*Trade Mark Reg. U. S. Pat. Off.

H & S SPEED REDUCERS

save maintenance and space with

Greater safety



• Since 1940 the Horsburgh & Scott Herringbone Speed Reducer illustrated above...driving an Epworth Manufacturing Company Ball Mill in a large paint manufacturing plant... has been in operation with *no* repairs necessary. The service is severe with heavy starting load and the machine operates continuously for periods of 24 to 72 hours. As compared with the old drives the results are: greatly reduced maintenance and space... greater safety is also an important feature. H & S Speed Reducers offer many savings and advantages throughout the range of industry...it will pay you to investigate.

THE HORSBURGH & SCOTT CO.

GEARS AND SPEED REDUCERS

5112 HAMILTON AVE. • CLEVELAND 14, OHIO, U.S.A.

Send note on Company Letterhead for Speed Reducer Catalog 46

Standard Oil Co. of Ohio. System is installed in condenser boxes for the high-heat, high-pressure cracking process prior to storage to eliminate costly maintenance and replacement.

Special electrodes are immersed in the water from the top of the open boxes and direct current is impressed on these electrodes which radiate through the water to the metal surfaces of the piping and the box. Current enters the metal surfaces and prevents the electro-chemical action which causes corrosion.

This installation utilizes specially designed selenium rectifiers. In addition, the installation considers all factors for maximum cathodic protection, such as water and metal chemical characteristics, dissolved oxygen content, temperatures, protective coatings, spacing of pipe coils and supporting frames, and dissimilar metals.

Tool Control Can Boost Output

A plan book showing how its CCC plan for co-ordinated tool control can be effectively used for increasing production and productive efficiency is being issued by Carboloy Department of General Electric Co. Essential operating details of the plan itself remain virtually unchanged since the objectives of the plant always have been to insure obtaining the maximum in: Production per machine, speeds, adherence to tolerances, tool life and pieces per tool. At the same time down time is to be kept to a minimum as are the number of rejects.

Under the revised approach to the plan, to meet current conditions, increased emphasis is put on factors which will help meet labor shortages, standardize on readily available tool styles and sizes, conserve scarce carbides and reduce rejects. Copies of the book are available by writing to Carboloy Department of General Electric Co., Box 237, Roosevelt Park Annex, Detroit 32.

Soaking Pit Is Fuel Miser

Loftus Engineering Corp., 610 Smithfield St., Pittsburgh, has issued a technical bulletin on a soaking pit which will reduce fuel consumption by 40 per cent while almost doubling amount of steel heated. The company's soaking pit differs from conventional regenerative furnaces in providing for integrated recuperation. The "low stress—hi-heat" round recuperator preheats air from 1400 to 1850° F.

Other features of the soaking pit are: Cycle time for accelerating initial temperature head, recircula-

When You Want

QUALITY and SERVICE

THERE IS A MEEHANITE FOUNDRY NEAR YOU

MEEHANITE FOUNDRIES SERVE ALL IMPORTANT PRODUCTION CENTERS

- American Brake Shoe Co. . . . . Mahwah, New Jersey
- The American Laundry Machinery Co. . . . . Rochester, New York
- Atlas Foundry Co. . . . . Detroit, Michigan
- Banner Iron Works . . . . . St. Louis, Missouri
- Barnett Foundry & Machine Co. . . . . Irvington, New Jersey
- E. W. Bliss Co. . . . . Hastings, Mich. and Canton, O.
- Builders Iron Foundry . . . . . Providence, Rhode Island
- Continental Gin Co. . . . . Birmingham, Alabama
- Crawford & Doherty Foundry Co. . . . . Portland, Oregon
- The Cooper-Bessemer Corp. . . . . Mt. Vernon, Ohio and Grove City, Pa.
- Empire Pattern & Foundry Co. . . . . Tulsa, Oklahoma
- Farrel-Birmingham Co., Inc. . . . . Ansonia, Connecticut
- Florence Pipe Foundry & Machine Co. . . . . Florence, New Jersey
- Fulton Foundry & Machine Co., Inc. . . . . Cleveland, Ohio
- General Foundry & Manufacturing Co. . . . . Flint, Michigan
- Greenlee Foundry Co. . . . . Chicago, Illinois
- The Hamilton Foundry & Machine Co. . . . . Hamilton, Ohio
- Hardinge Company, Inc. . . . . New York, New York
- Hardinge Manufacturing Co. . . . . York, Pennsylvania
- Johnstone Foundries, Inc. . . . . Grove City, Pennsylvania
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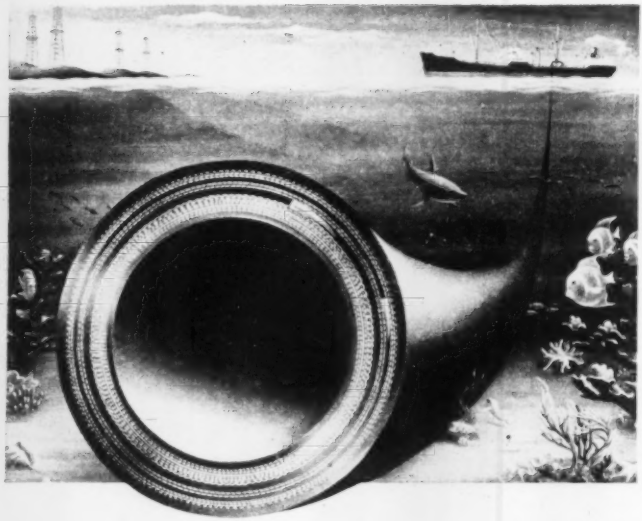
- Pohlman Foundry Co., Inc. . . . . Buffalo, New York
- Rosedale Foundry & Machine Co. . . . . Pittsburgh, Pennsylvania
- Ross-Meehan Foundries . . . . . Chattanooga, Tennessee
- Shenango-Penn Mold Co. . . . . Dover, Ohio
- Standard Foundry Co. . . . . Worcester, Massachusetts
- The Stearns-Roger Manufacturing Co. . . . . Denver, Colorado
- Traylor Engineering & Mfg. Co. . . . . Allentown, Pennsylvania
- Valley Iron Works, Inc. . . . . St. Paul, Minnesota
- Vulcan Foundry Co. . . . . Oakland, California
- Warren Foundry & Pipe Corporation . . . . . Phillipsburg, New Jersey

MEEHANITE

New Rochelle, N.Y.

This advertisement sponsored by foundries listed above.



INSIDE STORY

OF SMOOTH PERFORMANCE

Take another look at the inside of this undersea hose. It's as smooth as your garden hose, even though it is 12" in diameter and its walls contain heavy wires for additional strength.

It took a lot of skillful engineering to produce that smooth interior. *Hewitt-Robins was the first to do it.*

Because there are no wire ridges and no corrugations, turbulence is minimized . . . sediment can't collect . . . cleaning is simplified. And flow is as much as 50% faster than through a rough-bore hose of the same diameter and length.

Smooth-bore hose is one of a long list of basic advancements in hose construction originated by Hewitt-Robins.

For over a century, we have been building better hose and other industrial rubber products to facilitate the handling of fluid and solid bulk materials.

Today, we produce over 1000 different types of hose made from natural and synthetic rubber. Each is able to meet precise requirements—for flexibility and lightness; for resistance to abrasion, corrosion, erosion and shock; for ability to stand up under pressure and suction.

If you have a hose problem or need, come to hose headquarters.

HEWITT HR ROBINS

Executive Offices: 370 Lexington Avenue, New York 17, N. Y.

HEWITT RUBBER DIVISION: Belting, hose and other industrial rubber products

ROBINS CONVEYORS DIVISION: Conveying, screening, sizing, processing and dewatering machinery

ROBINS ENGINEERS DIVISION: Designing and engineering of materials handling systems

Hewitt-Robins is participating in the management and financing of Kentucky Synthetic Rubber Corporation

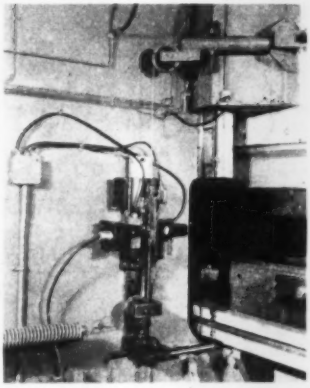
tion through normal combustion system, fully automatic dual combustion system with dual outlets and "Thermal flywheel" method of assuring overall constant temperature.

Humidity Control Aids Industry

Humidity conditioning equipment and its utilization by industry are related in three articles appearing in "The Humidity Engineer" a quarterly publication of Surface Combustion Corp., Toledo, O.

Feature story in the current issue tells how Kathabar humidity conditioning equipment is used for defense production. Specifically explained and illustrated with flow diagrams are applications for preventing moisture condensation on walls of atomic energy and water filtration plants and in cargo ship holds. Also described are methods for maintaining extremely low dew points in military powder plants, creating diverse conditions for test purposes in research laboratories and facilitating the continuous manufacture of laminated safety glass.

Ram Uses Photoelectric Control



PRESELECTED degree of tilt down to a thousandth of an inch or holding the ram completely level through its stroke is possible on this press brake made by Allsteel Press Co., Chicago, through use of General Electric's electronic system. A photoelectric system controls a reversible booster hydraulic pump used to transfer oil from one line to another to maintain position synchronization of ram ends. Two independent hydraulic cylinders supplied from separate matched pumps actuate the ram. Booster pump is driven by a motor supplied by an amplidyne generator which is controlled by the photoelectric system. Any tilt of the ram raises or lowers a barrier suspended between the photoelectric cell and the light source

MOBILIZE YOUR PLANT

for maximum production now!

YALE
4,000 LB. CAPACITY
ELECTRIC TRUCK

Get the most from every machine ...every hour...every dollar with

YALE INDUSTRIAL TRUCKS

HERE are gas and electric trucks that will help gear your plant for *all-out* efficiency!

These Yale fork lift trucks stack materials nearly 16′ high...put wasted aisle and overhead space to work...relieve workers from costly, slow, back-breaking hand lifting.

They stay on the job, too...keep production lines well fed and shipments rolling. For example, the Yale electric truck with magnetic contactor controls cuts "down time" to a minimum. The Yale gas truck with fluid drive greatly increases clutch life and reduces maintenance costs. And these are only two Yale exclusives—there are many others!

Let Yale help you mobilize your plant for *greater production at lower unit costs* right now! Send coupon today for all the facts.

SEND THIS
COUPON TODAY

THE YALE & TOWNE MFG. CO.
Department 88
Roosevelt Boulevard & Haldeman Ave., Philadelphia 15, Pa.

☐ *Please have your local representative call on me.*
☐ *Please send me, free, the "How Book of Cost Cutting Material Handling."*

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City_____ State_____

YALE & TOWNE

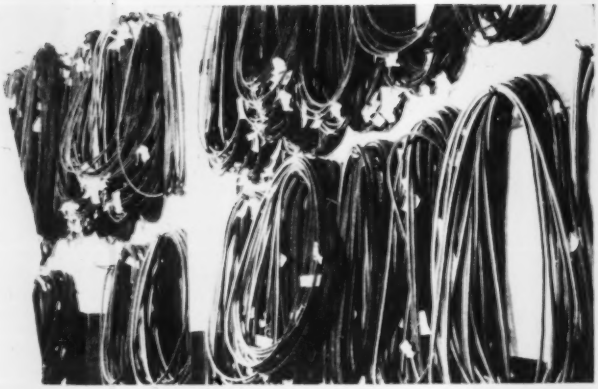
The Yale & Towne Manufacturing Co., Philadelphia 15, Pa.

Yale is the registered trademark of the Yale & Towne Manufacturing Co.

In Canada write The Yale & Towne Manufacturing Company, St. Catharines, Ontario

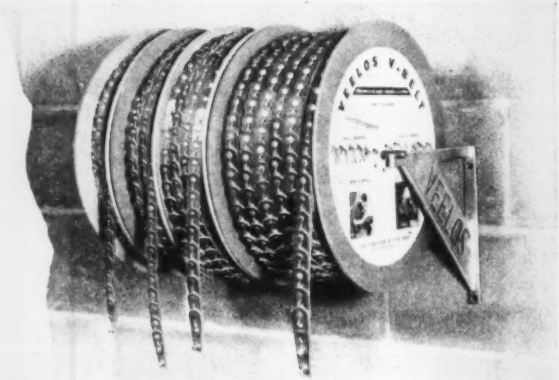
Why carry this Costly Inventory?

When you switch to Veelos—the adjustable v-belt—you end for all time the storage problem, the inventory control problem and the "frozen investment" problem that come with carrying this expensive, space-wasting stock of endless v-belts.



4 reels of *VEELOS* is your Complete Inventory

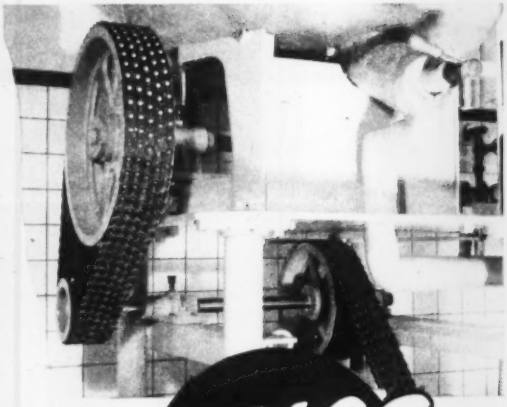
With just these 4 reels of Veelos you can take care of *every* v-belt need in the O, A, B and C widths—these 4 reels replace up to 316 sizes of endless v-belts . . . and you have the right size belt when you need it. There's no storage or control problem—inventory costs are at a minimum.



and *VEELOS* provides Peak Machine Production

Vibrationless, full power delivery—simple, easy adjustment to maintain uniform tension on all belts—quick installation (unnecessary even to dismantle outboard bearings) these are Veelos advantages that mean maximum production.

We have a copy of the **VEELOS DATA BOOK** for you—write today and we'll send you this complete story on Veelos—the adjustable v-belt.



VEELOS THE LINK **V-BELT**

ADJUSTABLE TO ANY LENGTH • ADAPTABLE TO ANY DRIVE

Made in all widths in three types: regular, oil-proof, static conducting. Iso double V in A and B. Packaged on reels in 100-foot lengths. Sales engineers in principal cities; over 350 distributors throughout the country. VEELOS is known as VEELINK outside the United States.

MANHEIM MANUFACTURING & BELTING COMPANY • MANHEIM, PENNA.

CALENDAR
OF MEETINGS

August 20-23, American Institute of Electrical Engineers: Pacific general meeting. Multnomah Hotel, Portland, Oreg. Institute address: 33 W. 39th St., New York 18. Secretary: H. H. Henline.

August 20-23, National Association of Power Engineers, Inc.: Annual meeting and exhibit. Hotel Plaza, San Antonio, Tex. Association address: 176 W. Adams St., Chicago 3. secretary: A. F. Thompson.

September 3-7, American Chemical Society: Annual meeting. Hotel Statler, Washington. Society address: 1155 16th St. NW, Washington 6. Executive secretary: Alden H. Emery.

September 4-6, Liquefied Petroleum Gas Association: Pacific Coast convention. Fairmont Hotel, San Francisco. Association address: 11 S. La Salle St., Chicago 3. Executive vice president: Howard D. White.

September 5-7, American Hot Dip Galvanizers Association Inc.: Annual meeting. The Greenbrier, White Sulphur Springs, W. Va. Association address: 2311 First National Bank Bldg., Pittsburgh. Secretary: Stuart J. Swensson.

September 6-7, Rail Steel Bar Association: Semi-annual meeting. The Broadmoor, Colorado Springs, Colo. Association address: 38 S. Dearborn St., Chicago. Secretary: W. H. Jacobs.

September 8-9, New York; September 14-15, Washington—International Union of Pure and Applied Chemistry: Bi-annual meeting. Chairman, U. S. division: Prof. W. Albert Noyes Jr., University of Rochester.

September 10-13, International Congress of Pure and Applied Chemistry: New York. Chairman, U.S. division: Dr. Arthur B. Lamb, Harvard University.

September 10-14, International Foundry Congress: Brussels. Address: General Secretary, Foundry Congress, c/o Fabrimetal, 17 Drapiers St., Brussels.

September 10-14, Instrument Society of America: National instrument conference and exhibit. Sam Houston Coliseum, Houston. Society address: 921 Ridge St., Pittsburgh 12. Secretary: Richard Rimbach.

September 10-15, Annual Industrial Engineering Conference: Mechanical Department, Industrial Engineering Division, Michigan State College, E. Lansing, Mich.

September 11-13, Society of Automotive Engineers: Tractor meeting. Hotel Schroeder, Milwaukee. Society address: 29 W. 39th St., New York. Secretary: John A. C. Warner.

September 14-16, American Society of Sanitary Engineering: National convention. Hotel Statler, Detroit. Society address: Lion Freemont St., McKeesport, Pa. Secretary: T. M. Dugan.

September 17-19, Allied Railway Supply Association: Fall meeting and exhibit. Hotel Sherman, Chicago. Association address: Box 5522, Chicago 80. Secretary: Charles F. Weil.

September 21-22, National Association of Waste Material Dealers Inc.: Fall meeting, Saranac Inn, Upper Saranac Lake, N. Y. Association address: 1109 Times Bldg., New York 18. Secretary: Clinton M. White.

September 24-25, Steel Founders Society of America: Fall meeting. The Homestead, Hot Springs, Va. Society address: 920 Midland Bldg., Cleveland 20. Secretary: F. Kermit Donaldson.

September 24-25, American Coke & Coal Chemicals Association: Annual fall meeting. Skytop Lodge, Skytop, Pa. Institute address: 711 14th St. NW, Washington. Executive secretary: Samuel Weiss.

September 24-26, National Truck Body Mfrs. & Distributors Association: Annual convention and suppliers exhibit. Chalfonte-Haddon Hall, Atlantic City, N. J. Association address: 346 Connecticut Ave. NW, Washington. Secretary-manager: Shipley D. Burton.

Serving our COUNTRY
Serving our CUSTOMERS

We at Michigan are proud of our production record during World War II, when we manufactured many thousands of tubular products for the armed forces. We supplied electric resistance welded steel tubing both in straight lengths and fabricated into numerous intricate parts for many different uses, in vehicles, airplanes, bombs, etc.

Once again Michigan is prepared to serve the defense needs of our country with tubing for any application, in addition to meeting the requirements of customers for consumer products.

Whether for defense purposes or for products to maintain and improve our American living standards, Michigan engineers will be pleased to consult with you on tubing for better products at lower production costs.

Michigan Tubing

has uniform strength, weight, ductility, I. D. and O. D., wall thickness, machinability, and weldability. It can be flanged, expanded, tapered, swaged, beaded, upset, flattened, forged, spun closed, fluted, and rolled. Available in a wide range of sizes, shapes and wall thicknesses, prefabricated by Michigan or formed and machined in your own plant.

Consult us for engineering and technical help in the selection of tubing best suited to your needs.

Michigan ELECTRIC RESISTANCE WELDED STEEL TUBING
THE OLDEST NAME IN STEEL TUBE PRODUCTS CO.

More Than 30 Years in the Business
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ALLIANCE

improved

SOAKING PIT CRANE

with MULTI-PURPOSE tongs

Here's a rugged, lighter weight Soaking Pit Crane that handles any width slab or ingot. It'll make bottom . . . afford the same visibility as the high rack type Soaking Pit Crane, yet takes up no more head room than a low type Soaking Pit Crane.

Special features include: telescopic ram, all operating mechanism located on deck of trolley, operator's cage on deck of trolley provides best visibility and greatest distance from all sources of heat.

Multi-Purpose Tongs provide gripping range of 6" minimum to 66" maximum opening. Consequently, a much greater range of ingot and slab sizes can be readily handled.

The Multiple Range Tongs can be installed on any model or make of Soaking Pit Crane by Alliance Engineers who will be happy to discuss your specific requirements or give you general information of interest to your industry.

- MAXIMUM RANGE CAPABILITIES
- CRANE REQUIRES MINIMUM SPACE
- AFFORDS MAXIMUM VISIBILITY
- ALL MECHANISM EASILY ACCESSIBLE
- KEEPS OPERATOR AWAY FROM HEAT

Tongs Easily Adjustable

THE ALLIANCE MACHINE COMPANY

MAIN OFFICE
ALLIANCE, OHIO

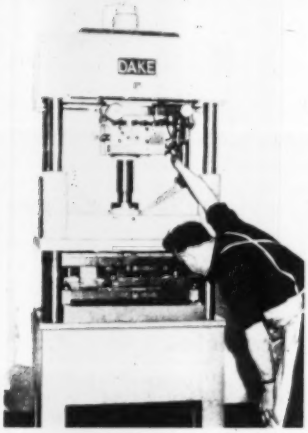
PITTSBURGH OFFICE
1622 OLIVER BUILDING, PITTSBURGH, PA.

LADLE CRANES • GANTRY CRANES • FORGING MANIPULATORS • SOAKING PIT CRANES • STRIPPER CRANES • SLAB AND BILLET CHARGING MACHINES • OPEN HEARTH CHARGING MACHINES • SPECIAL MILL MACHINERY • STRUCTURAL FABRICATION

New Products and Equipment

Die Try-Out Presses

A series of hydraulic presses designed for use in die matching to avoid tying up production equipment is announced by Dake Engine Co., Grand Haven, Mich. Presses may also be used for short production runs and for manufacturing samples. Included



are both single and double-acting designs in capacities ranging from 25 to 125 tons.

All models are actuated by a hydraulic mechanism which is operated either by electric motor or by an air cylinder designed to attain maximum power and speed at 90 or 145 pounds air pressure. Single-acting models are powered on the up stroke and return to starting position by gravity. Double-acting models are powered on both up and down strokes and are provided with a rapid advance mechanism which operates until the press is brought under load.

Check No. 1 on Reply Card for more Details

Volume Precision Finishing

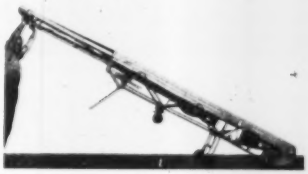
Large quantities of parts are precision finished at one time in the model DW-60-36-2 automatic control precision tumbling machine developed by the Roto-Finish Co., Kalamazoo, Mich. Machine is pushbutton operated and has all controls on one panel.

Once started, automatic timer will stop its operation any time from 0 to 20 hours without further attention. A 5 hp variable speed power unit with remote control handle adjusts the speed of the cylinder from 10 to 30 rpm. Unit is rigidly built of 3 16-inch steel and each of its two compartments has a capacity of 18 cubic feet. Side supports, motor mount and floor are all integral parts of the frame. Cylinder shafts are mounted in 2 7/16-inch self aligning pillow block.

Check No. 2 on Reply Card for more Details

Lightweight Conveyor

Lightweight Adjustoveyor is a companion unit to the basic model previously introduced by Stewart-Glapat Corp., Zanesville, O. It is designed for applications not requiring the extreme lengths and massive load carrying capacity of the regular unit, but retains most of the basic features of the larger model. It is counter-



balanced for ease of handling and can be moved to different applications around the factory.

Construction features heavy truss design to carry a total weight of 850 pounds and a maximum weight of 300 pounds plus a ball bearing mounted roller bed on which the belt rides. Unit measures 10 feet closed and 17 feet 6 inches fully extended and can be operated at any distance in between. It will stack to a height of 10 feet at a maximum stacking angle of 30 degrees.

Check No. 3 on Reply Card for more Details

Filmatic Grinder Improved

Several improvements in its 10 and 14-inch L plain hydraulic grinding machines are announced by Cincinnati Grinders Inc., Cincinnati 9, O. Headstock of these machines is completely redesigned, and is now powered by 1-hp alternating current motor, a magnetic brake is built in, power is transmitted entirely through v-belts and an eccentric arrangement for the primary countershaft provides a way to adjust belt tension and change the belt on the four step pulley.

Bed is 2 inches lower than before; distance from floor line to centers now is 39½ inches. Grinding wheel collets are designed for 12-inch hole wheels for continued usefulness on smaller machines after the outside diameter wears beyond the size for efficient grinding.

Check No. 4 on Reply Card for more Details

Fast Pipe Threading

Cleveland Tapping Machine Co., subsidiary of Automatic Steel Products Inc., Canton, O., has developed a machine for the pipe and conduit fittings industries. Three models, F-1, F-2, and FT-1 are available. The first two machines are fully automatic in their operation and are fed from a magazine-type hopper. They do 90 degree ells, street ells or reducer ells at each stroke of the machine, threading and chamfering simultaneously from the cored hole.

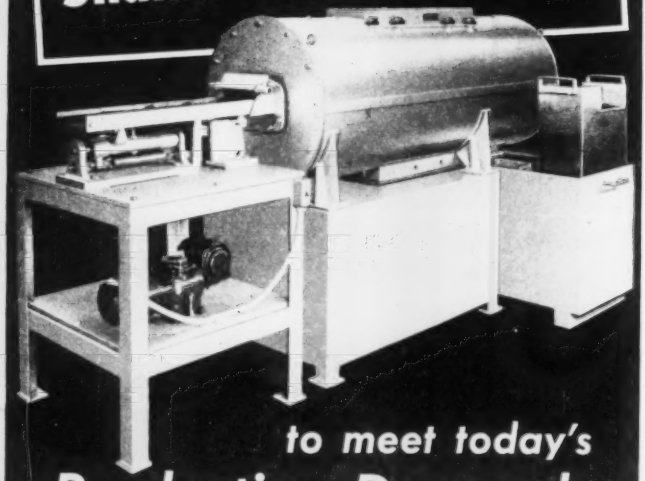
FT-1 machine will tap and chamfer, complete, two tees at each stroke of the machine. Each of the horizontal spindles on the F-1 machine has a 5-hp motor and one 7½-hp motor is provided for the two vertical spindles. The F-2 machine has four 5-hp motors, one to each spindle. The air operated, automatic fixture is self-compensating and slides on hardened and ground round ways.

Check No. 5 on Reply Card for more Details

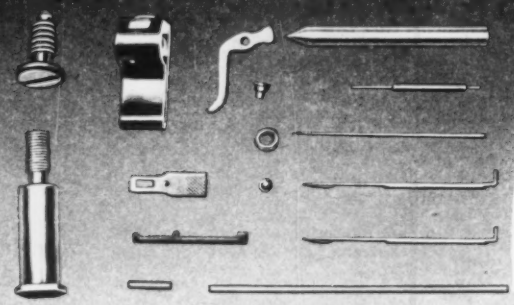
Oil Mist Hazards Removed

Problems caused by the fine oil mist emanating from high speed cutting and grinding machine operations can be eliminated by an oil mist precipitator developed by Trion Inc., 1000 Island Ave., McKees Rocks, Pa. Oil mist from machining operations is charged as it passes through an electrostatic field and is then attracted to plates of opposite polarity from which it eventually drains into a collecting pan for ultimate reuse. Under normal operations, daily oil recov-

use this HEVI DUTY
Shaker Hearth Furnace



to meet today's
Production Demands



Hevi Duty **Shaker Hearth Furnaces** are used to bright carburize, bright dry cyanide or bright harden these small parts without distortion. Shaker Hearth furnaces process up to 150 lbs. per hour. Case depths are accurately controlled, and results are uniform. Learn more about this versatile Hevi Duty furnace.

Write for Bulletin HD-850 today.

HEVI DUTY ELECTRIC COMPANY
HEAT TREATING FURNACES HEVI-DUTY ELECTRIC EXCLUSIVELY
DRY TYPE TRANSFORMERS — CONSTANT CURRENT REGULATORS
MILWAUKEE 1, WISCONSIN

ery may be as great as 5 gallons.

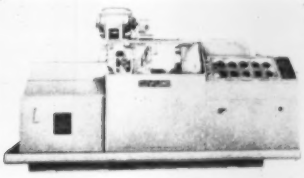
Precipitator is constructed of heavy sheet metal, is of a compact design and is adaptable for floor mounting or overhead ceiling suspension. Units are available in four standard models of either 1330 or 2000 cfm capacity. In each capacity one model is avail-

able with ionizing-collecting cell and motor blower unit and the second model is without the motor blower unit. Power pack is in a separate cabinet in all four models.

Check No. 3 on Reply Card for more Details

Automatic Redesigned

Flexibility and performance of the model AB Dialmatic made by Cleveland Automatic Machine Co., Cincinnati 12, O., are improved through redesigning. Electric feed drive which controls turret feeds without making cam changes consists of a control panel with ten dialed rheostats, feed calculation chart, 3 hp feed motor,



dynamatic coupling, rotary selector switch, shifting disk and shifting mechanism. With the spindle speeds set and the feed for each turret tool position determined, dial settings for each rheostat can be established by referring to the feed calculation chart located at the right hand side of the control panel. Separate, infinitely adjustable feeds can be preselected for both forward and return motion of each of the five turret positions and the feed rate for any turret tool can be changed while it is cutting.

Feed drive mechanism is simplified and a sheet metal guard which includes two swinging doors provide ac-

A Winning Pair

These two trade marks may be lacking in sex appeal, but they *do* offer you an attractive combination for fast, dependable warehouse service on...

COLD FINISHED BARS — Rounds, Flats, Squares, Hexagons.

STRIP — Cold Rolled, Hot Rolled, Pickled. Coils and Cut Lengths.

SPRING STEEL — Tempered, Annealed.

ALUMINUM — Sheets, Strip, Bars, Tubing.

SHEETS — Cold Rolled, Hot Rolled, Pickled, Galvanized. Coils and Cut Lengths.

TUBING — Seamless and Welded, Carbon and Alloy.

TIN MILL PRODUCTS — Black Plate.

STAINLESS — Sheets, Strip, Bars, Tubing.

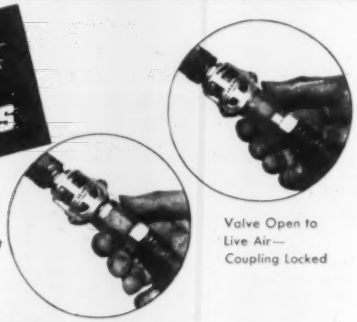
DRILL ROD • FLAT WIRE • SHANK STEEL • SHIM STEEL • SILVER BRAZING ALLOYS AND FLUXES

Complete Facilities for Cutting, Sawing, Shearing, Slitting, and Storage
Coil Leveling and Cutting to Length

FORT DUQUESNE STEEL COMPANY
PITTSBURGH 33, PENNSYLVANIA

The HAMILTON STEEL COMPANY
CLEVELAND 8, OHIO

Quick-As-Wink
AIR AND HYDRAULIC
Control Valves



Valve Closed to Live Air—Open to Exhaust

Valve Open to Live Air—Coupling Locked

VALVE COUPLINGS ¼", ⅜", ½", & ¾" SIZES

For Economy and Safety

● These couplings permit air to be shut off and tools changed quickly without going to the main shut-off valve. Coupling jaws are automatically self-locking when valve is open to air supply. The coupling cannot be disconnected until the valve sleeve is moved to closed and exhaust position,—thus preventing accidents and injuries. Pressures to 250 p.s.i.—hose shank, male or female pipe connections. *Send for Bulletin No. 104-C. It gives full details and prices.*

Quick-As-Wink
AIR AND HYDRAULIC
Control Valves

Hand, Foot, Cam, Pilot, Diaphragm and Solenoid Operated

Mfd. by C. B. HUNT & SON, INC., 1926 East Pershing St., Salem, Ohio

SPOT-Positioning

OF HEAVY MACHINERY is accomplished by...

"Simple Fingerwork"

and this Magnetic Controlled

EUCLID CRANE

A simplified push-button system affords complete, precise floor control of handled loads on this 25-ton Euclid Crane.

A Frequency Relay Dynamic Lowering Control permits non-overhauling loads with empty or slightly loaded hook to start down slowly since weak "down power" is permissible.

Euclid Cranes are built in a range of styles and capacities to meet varied material handling needs. Write for information

CRANES AND HOISTS
Raise Profits

THE EUCLID CRANE & HOIST CO.

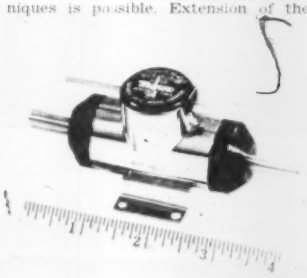
1364 CHARDON ROAD • EUCLID, OHIO

cess to this drive for maintenance purposes. Disk type friction clutch, which controls the feed and rapid traverse of the machine is shifted automatically by a small hydraulic cylinder. Cutting speeds for all kinds of metals and all types of cutting tools are provided by 112 spindle speeds ranging from 24 to 1820 rpm. Four automatic spindle speed changes, both forward and reverse are available for each set of change gears. Machine is built in both $2\frac{1}{2}$ and 3-inch capacity bar machine. Either of these machines can be converted to a chucking machine by using a chucking attachment.

Check No. 7 on Reply Card for more Details

Midget Speed Changer

Ratio is controlled in the miniature variable-ratio speed changer made by Metron Instrument Co., 432 Lincoln St., Denver 9, Colo., by the use of a push rod. Through the application of an extended push rod, levers, cams or virtually any properly applied linkage, a wide variety of control techniques is possible. Extension of the



push rod makes remote lever control possible and remote ratio indication, on a scale of any size, is obtained by means of a scale associated with the remote actuating speed adjuster.

Small, compact and completely sealed, drive has ratings up to 72 ounce-inch torque, 0.025 hp, 20,000 rpm and ratio is infinitely variable from 1/6 to 6. Applications include timers, recorders, controllers, computers and low power devices requiring remote or automatic control.

Check No. 8 on Reply Card for more Details

Vertical Sump Pumps

Four basic units in a range of sizes from 1 to 10-inch discharge with capacities from 10 to 3000 gpm and heads up to 140 feet, constitute the line of vertical sump pumps announced by Deming Co., Salem, O. They are furnished with electric motors from ½ to 75 hp or for steam turbine drive. Motor mouting is reg-

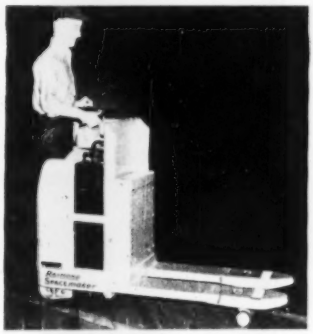
ularly designed for standard NEMA type C flange but the pumps can be furnished with adapter flange for other types of motor mounting brackets.

Guide bearing assemblies are interchangeable as intermediate or bottom bearings in the pump assembly. In the thrust bearing assembly, the lower half coupling fits accurately into the bore of a large capacity angular contact radial and thrust ball bearing. Semiopen type impeller is adjustable vertically with shaft and mounted on shaft with locking taper, woodruff key and safety lock nut. Duplex units can be furnished and equipped with alternator float switch to permit automatic operation of each pump in sequence or both pumps simultaneously.

Check No. 9 on Reply Card for more Details

Faster Pallet Handling

Rider-type, low-lift electric truck that handles both single and double face pallets is introduced by Lyon-Raymond Corp., 91-83 Madison St., Greene, N. Y. Truck was designed to speed up handling by enabling operator to ride while picking up and delivering unit loads. It travels up



to 5 mph carrying 400-pound loads, and up to 6 mph when empty.

Truck can right angle pickup or spot loads from aisles 6-feet wide. It is being offered with a carrying frame 30 to 60 inches long and 24, 27 or 30 inches wide. Overall length of power unit and riding areas combined is 28 inches. It uses either 250-440 ampere hour 6 cell lead batteries or a 300 ampere hour 10 cell Edison battery.

Check No. 10 on Reply Card for more Details

Compressed Air Cleaner

Dirt and metal particles are forced into a container through an agitating suction created by the jet principle in an industrial cleaner made by Vibro-Pneumatic Cleaner Co., division

HIGH PRESSURE HYDRAULIC STRAINER to 1500 p.s.i.

protects valves, cylinders and spray nozzles

● Electric furnace cast steel housing. The strainer consists of machined and grooved bronze rings nested around a heavy slotted multi-ported bronze back-up cylinder. The rings can be loosened and cleaned easily with compressed air, or completely removed and cleaned in solvent. Repay their cost many times over. Widely used in steel mills and forging shops to prevent partial plugging of spray nozzles, resulting in rejects due to scale streaks. 1½" to 6" sizes. Send for Data Sheet No. 3402. It gives full details.

Quick-As-Wink
AIR AND HYDRAULIC
Control Valves

Hand, Foot, Cam, Pilot, Diaphragm and Solenoid Operated

Mfd. by C. B. HUNT & SON, INC., 1925 East Pershing St., Salem, Ohio

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Write on your business letterhead, today.

SOCKET UNBRAKO SCREWS

"Standard" recommends Standards

SPS STANDARD PRESSED STEEL CO.

JENKINTOWN 33, PENNSYLVANIA

of Patterson Products, 518 Maccabees Bldg., Detroit 2, Mich. This container is supported on the back by a conventional belt and harness assembly and is encircled by a fabric shield. A jet can be directed forward through an orifice in the cleaner head to dislodge dirt and metal particles from inaccessible places to spots where they can be picked up by changing to a suction action. Unit operates from any 80 psi and up compressed air source.

Standard nozzle widths of 5, 8 and 10 inches can be furnished. Wand lengths are from 14 inches to 6 feet depending on the application. Three different orifices are furnished with each machine so that amount of suction and air consumption can be adjusted to conditions. Several sizes of castered tank models from 20 gallons to 55 gallons can be supplied for wet or dry cleaning operations.

Check No. 11 on Reply Card for more Details

More Efficient Control

An electrically recorded inventory of production, payroll data, etc., has been developed to increase the efficiency of factory controls by A. Kimball Co., 307 W. Broadway, New York 13, N. Y. Unit makes use of electronic speed and automatic control without special training on the part of the operator and assembles data previously dependent upon manually operated key punching.

Punch tickets are issued at the rate of 180 per minute on the PM 75. Up to 30 lines of punch marking can be accomplished. These tickets are then used to flow with job or material. When operation is complete, ticket is forwarded to punch card department where Potter electronic scanner produces standard cards at rate of 100 per minute.

Check No. 12 on Reply Card for more Details

TO IMPROVE ALL TYPES OF ASSEMBLIES . . . produced in any quantity . . . large production runs a specialty . . . our engineers will be glad to assist in the design and application of any flat and round wire springs, stampings or Snap-Clips.

We are experienced suppliers to the automotive, aircraft, ordinance, appliance, electrical and many other industries where assembly problems occur.

Send Us Your Inquiries

Subsidiary of Barium Steel Corporation — Stronger for the Nation

The CUYAHOGA SPRING Co.

10200 BEREA ROAD • CLEVELAND 2, OHIO

Plating Rectifier

Style RA selenium rectifier designed for electroplating and similar applications is announced by Electronic Rectifier Co. Inc., Rochester 2, N. Y. It has a full wave rectifier circuit with voltage continuously variable

from 0 to 8 v dc at 150 amp capacity or 0 to 16 dc at 75 amp capacity. Voltage change terminals and output terminals are mounted on the rectifier front panel.

Voltmeter and ammeter are of the $3\frac{1}{2}$-inch rectangular panel type with D'Arsonval movements and 2 per cent accuracy. Circuit breaker is of the fully magnetic type which gives protection at all voltage settings. The heavy gage pressed steel cabinet has a hinged top cover for easy access to the ac terminal strip. It is suitable for wall, shelf or floor models.

Check No. 13 on Reply Card for more Details

Exact Coolant Blending

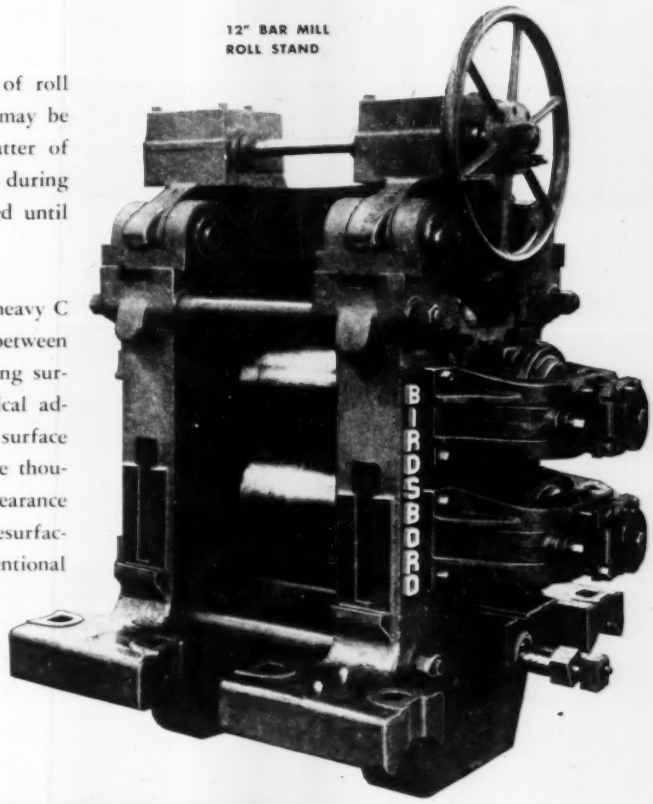
An automatic proportioning system for blending two or more of a wide variety of liquids, including coolant, is a development of Bowser Inc., Ft. Wayne 2, Ind. Controls on each meter permit instantaneous setting of

New BIRDSBORO Development

for Easy, Quick and Accurate End Roll Adjustment

Patented tilting caps permit changing of rolls through top of housing without disassembling end roll adjustment and with no loss in housing rigidity.

12" BAR MILL ROLL STAND



● Roller bearing locked to end of roll in totally enclosed housing . . . may be changed from roll to roll in matter of minutes . . . may be left on roll during dressing . . . need not be changed until roll is discarded.

Bearing housing held securely by heavy C clamps . . . no point contact between housing and clamp . . . self-aligning surface contact bearing permits vertical adjustment without wear of clamping surface . . . axial adjustments made to the thousandth of an inch . . . clamping clearance freely set and locked, eliminating resurfacing and grinding required by conventional locking devices.

BIRDSBORO
STEEL FOUNDRY & MACHINE CO.
Birdsboro, Penna.

STEEL MILL MACHINERY

Designers and Builders of
Steel Mill Machinery • Crushing Machinery • Rolls
Hydraulic Presses • Special Machinery • Steel Castings

Offices in
Birdsboro, Pa. and Pittsburgh, Pa.

MM 18-51

ingredient proportions in increments to meet needs. Total throughput is recorded on a master counter and each ingredient is recorded separately on its own meter. The master counter is available with predetermining device and ticket printer, and the meter for each ingredient is available with standard counter or ticket printing unit.

Failure of any ingredient supply automatically shuts off the entire system and if the supply to any meter slows down for any reason, all meters synchronize automatically to the same rate of delivery. Measurement is by positive volumetric displacement and any number of ingredients may be blended. If the number of ingredients is reduced one or more meters may be made inoperative. Dials and gages are visible from the outside of a cabinet which encloses the entire blender.

Check No. 11 on Reply Card for more Details

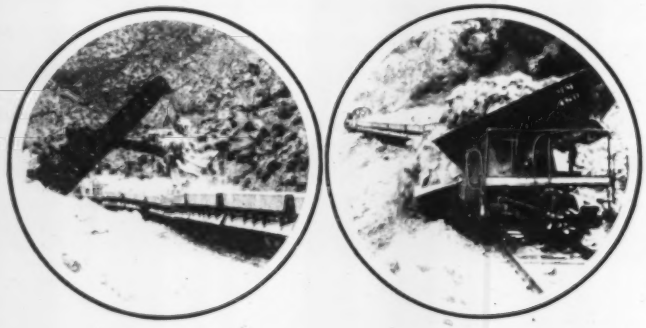
Packaged Boiler Introduced

Ticosteam generator, a packaged steam power plant, is being introduced by Titusville Iron Works Co., Titusville, Pa. Operation is fully automatic with all controls contained in a single pushbutton controlled station. Mounting on a steel skid makes possible its installation on level and solid floors without foundation construction. No stack is required, a vent through the roof is sufficient.

Generators are designed for light oil and combination light oil and gas, heavy oil and combination heavy oil and gas, and for straight gas operation. Economy of operation is upheld by high combustion efficiency of 80 per cent plus and thermal efficiency of not less than 80 per cent for oil firing and 75 per cent for gas firing. Safety features include: Fireye combustion control head with alarm provision; thorough purge before ignition and also after combustion; dual low water cutoff; interlocking safety switches on pilot and main gas lines; motorized main gas valve; high pressure gas regulator; and gas electric ignition. All safety features are designed, in case of power breakdown, to fail in a safe position.

Check No. 15 on Reply Card for more Details

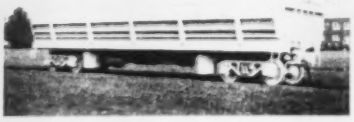
Yes, you're seeing DOUBLE



In fact, when you watch Differential Air Dump Cars in action you're seeing double in several respects —

DOUBLE ACTION — they dump cars both ways, to left or to right. The 50° dumping angle assures a clean dump, and the massive air cylinders (two on each side) assure speedy, reliable dumping power. The double trunnion, double fulcrum design are key features in Differential's amazing performance.

DOUBLE UTILITY — Good for hauling in ore and good for hauling out waste materials. Car is built to withstand abuse and heavy service. If you haul as many as 400 to 500 carloads yearly, the savings with Differential equipment will pay for the cars.



Differential Products Include: Air Dump Cars, Locomotives, Mine Cars, Mine Supply Cars, Rock Larries, Mantrip Cars, Dumping Devices and Complete Haulage Systems

DIFFERENTIAL STEEL CAR COMPANY

FINDLAY, OHIO

SINCE 1915 — PIONEERS IN HAULAGE EQUIPMENT

Phosphatizing Compound

Known as Keykote, a new phosphatizing process requiring 1 to 2 minutes, is announced by Kelite Laboratories Inc., Los Angeles 54, Calif. Made in powder form, it is used in concentration of 1 ounce per gallon, and can be applied by spray or immersion. No powder remains on work and it is not necessary to follow with a rinse.

Check No. 16 on Reply Card for more Details

Self-Leveling Locking Device

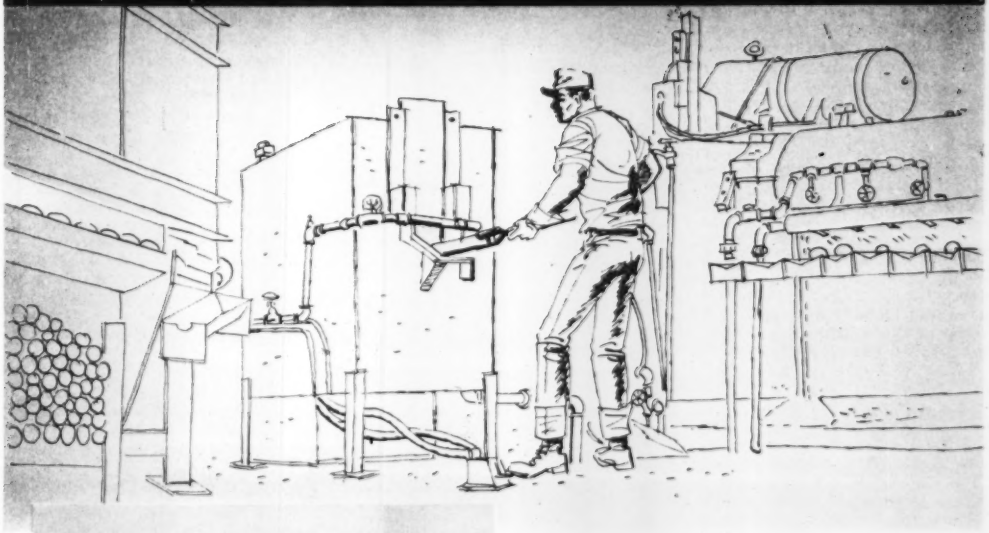
Elizabeth Iron Works Inc., Elizabeth, N. J., has developed an improved self-leveling locking device and floating arm for its one man bridge ramp. The locking pins are now an integral part of the floating arm locking bar that travels back and forth in its own housing along the floating arm and secures the ramp by butting up firmly against the loading platform.

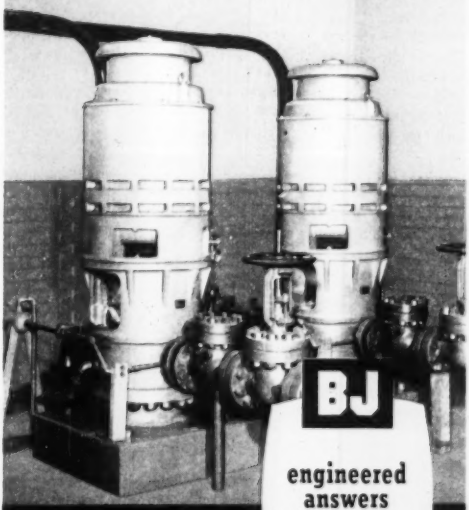
Check No. 17 on Reply Card for more Details

Rust Preventive Composition

Petrobase 210, a synthetic rust preventive composition that imparts effective rust preventive properties to petroleum oils, petrolatums and waxes, is announced by Pennsylvania Refining Co., Butler, Pa. Used in small quantities, it causes oils and waxes to displace preferentially water from metal surfaces. It also offers high humidity protection, acidic emulsion or solution displacement

KNOCKS OFF SCALE IN 1½ SECONDS!





BJ

engineered answers to pumping problems

This automobile plant uses two BJ Hydropress Pumps for descaling. One pump services as many as 10 cabinets (with 5 operating at once).

Auto industry uses BJ Hydropress Pumps to descale forged parts hydraulically!

Manual or mechanical descaling operations are time-taking and profit-robbing. Especially when a product requires several descalings during production. You'll save time, money and rejects by descaling hydraulically with BJ Hydropress pumps.

Here's one of the many examples of modern hydraulic descaling as used by the automotive industry. During the heating of axle bars prior to forming, scale is created and must be removed. This is done in a hydraulic descaling cabinet. As the bar is inserted, a lever is tripped and high velocity water at 1500 to 2000 psi hits the bar from 3 to 5 nozzles. Scale is removed in 1½ seconds! Afterwards the hot bar is placed on a forming roll.

The BJ Hydropress pump is ideal for this type of work because of its unique construction features. It does not require relief valves, accumulators or extra heavy fittings and piping. Its double volute design creates inherent balance at all heads and capacities. Its vertical construction allows the use of a simple foundation and a minimum of floor space.

For more information call your local BJ sales engineering office or write:

Byron Jackson Co.

Since 1872

P. O. Box 2017, Terminal Annex, Los Angeles 54, California

Sales Offices in Principal Cities

and salt water immersion and spray protection.

Check No. 18 on Reply Card for more Details

Expanding Tube Thermostat

Scaico expanding tube thermostat, made by Smith Control & Instrument Corp., Palmyra, N. J., utilizes a stainless steel tube as the expanding member and an Invar strip as the nonexpanding member. An Inconel spring gives fast make and break action. Thermostats are made in conduction, convection or immersion types.

Check No. 19 on Reply Card for more Details

Ceramic Strainer Core

A new foundry ceramic strainer core is available from American Clay Forming Co., Tiffin, O. It fits into the gate of the mold and strains the molten metal as it flows through the holes of the strainer core. Core is available in eight sizes.

Check No. 20 on Reply Card for more Details

Solvent Cleaner for Metal

Dynakleen, developed by Du-Lite Chemical Corp., Middletown, Conn., is a soak solvent for the quick removal of buffing and drawing compounds from knurled or fluted surfaces of all metals. It will remove all types of soils including greases, oils, discolorations, etc. It can be used in spray washing machines or applied by hand.

Check No. 21 on Reply Card for more Details

Open-End Ratchet Wrench

An open-end ratchet wrench, produced by Tubing Appliance Co., Los Angeles, Calif., has 61 socket sizes and is claimed to do the work of an open end wrench, crescent wrench, box wrench, socket wrench, ratchet wrench and crowfoot wrench. It can be used with a torque handle for torque rated fittings.

Check No. 22 on Reply Card for more Details

Coating Protects Metal

A transparent coating for polished and plated metals that protects against tarnishing is offered by Minnesota Mining & Mfg. Co., Detroit, Mich. It may be used on stainless steel, chrome plate and polished aluminum, both on the finished product and on already installed metal units.

Check No. 23 on Reply Card for more Details

Belt Guards and Legs

Benchmaster Mfg. Co., Los Angeles, Calif., offers a new series of belt guards in three sizes designed for use with their 1-ton, 4-ton standard, 4-ton deep throat and 7½-inch punch presses. Also available are cast iron legs for use with 4 and 7½-ton presses. Legs are equipped with a pedal which connects to the clutch for convenient foot control.

Check No. 24 on Reply Card for more Details

Four-Step Ladder

Designed for use with stock carts, a four-step ladder, announced by Ballymore Co., Wayne, Pa., has hangers that are adjustable for push bar heights from 30 to 38 inches and is mounted on ball bearing casters. Casters automatically retract when a person is on the ladder, putting two rubber tipped legs into firm contact with the floor.

Check No. 25 on Reply Card for more Details

Rotary Table

Proportioned for bench mill, shaper or drill press, is the new rotary table offered by Marvin Machine Products Inc., Detroit 26, Mich. It is furnished with three index plates, each of which has six circles of holes which give a wide range of division. It locks from the center.

Check No. 26 on Reply Card for more Details

Pneumatic Vibrators

Series 77 pneumatically operated vibrators, offered by Spo Inc., Cleveland 25, O., are recommended for applications such as removing match plate patterns from sand molds, providing steady flow of powdered or granular materials from hoppers, feeding small parts for assembly, etc. Five sizes are available with piston diameters ranging from ½ to 1¼ inches.

Check No. 27 on Reply Card for more Details

Hermetically-Sealed Resistors

Designed to meet the requirements of JAN-R-93, characteristic A, style RB11, are the miniature hermetically sealed resistors with solder lug terminals offered by Shallcross Mfg. Co., Collingdale, Pa. Known as Akra-ohm type 1180, they are 19/32-inch long by ½-inch diameter and are rated 0.25-watt at 250 v.

Check No. 28 on Reply Card for more Details

Chromate Coating Process

Enthone Inc., New Haven, Conn., has developed a new process for producing chromate coating on zinc and cadmium. It is applicable for both zinc plate and zinc base die castings. The mixture is operated at room temperature and after immersion for a few seconds, an adherent, chromate coating is produced. Various colors can be applied to the coatings by suitables dyes.

Check No. 29 on Reply Card for more Details

Materials Handling Baskets

Coleman - Pettersen Corp., Cleveland 14, O., announces a complete line of materials handling baskets that can be engineered to meet requirements of specific applications. They can be fabricated of wire up to ⅝-inch maximum diameter, wire mesh, expanded metal, sheet metal or any combination of these materials.

Check No. 30 on Reply Card for more Details

Air Friction Clutch

A new air friction clutch is announced by E. W. Bliss Co., Canton, O. Positive clutch and brake engagement is achieved through an arrangement of driving disk in which movement between full engagement and braking is only a fraction of an inch. Adequate self-induced ventilation assures rapid heat dissipation. Plates are arranged to compensate for wear automatically.

Check No. 31 on Reply Card for more Details

Abrasion Resistant Centers

Wear and abrasion resistant centers are available from Gorham Tool Co., Detroit 3, Mich. M-10-U, a wear and abrasion resistant material, developed by the company forms a core that is induction brazed into steel shank of the center after which the entire center is finish ground. Centers and half-centers are available with Morse, Jarno or Brown and Sharpe taper shanks in lengths from 3⅝ through 12¾ inches.

Check No. 32 on Reply Card for more Details

Automatic Roll Marker

Designed to eliminate secondary marking operations, an improved automatic roll marker for screw machines, etc., is available from New Method Steel Stamps Inc., Detroit 7, Mich. To change the die or rotary type holder, it is necessary to remove two Allen cap screws. Use of ball bearings eliminates need for boring, reaming and pressing in of solid bushings.

Check No. 33 on Reply Card for more Details

FOR MORE INFORMATION
on the new products and equipment in this section, fill in a card. It will receive prompt attention.

Helpful Literature

74. Chemical Motors

Westinghouse Electric Corp.—4-page illustrated booklet B-4687 describes Life-Line chemical motors for atmospheres where corrosive fumes and liquids are encountered. Internal construction features, treatment of external parts for corrosion resistance and results of tests are included.

75. Plastics

Richardson Co.—Line of Insurok laminated and molded plastics is illustrated and described in this 2-page folder. Products covered are fabricated parts, gears, bearings, post-formed and molded laminates. Material is made in all NEMA and other standard grades, plus exclusive special grades of unusual characteristics.

76. Large Pumps

Aldrich Pump Co.—Recently added line of 6-in. Direct Flow pumps is described in 8-page illustrated bulletin 67-A. Details of design and construction, performance data and specifications are given for three, five, six and nine-cylinder models for use in industrial, chemical, hydraulic and oil field service.

77. Heat Resistant Paints

Speco, Inc.—Five standard heat resistant paints are described in 1-page data sheet L-4261. Application information is given on standard aluminum, extra high heat aluminum, moderate heat aluminum, hot surface elastic black and quick drying black paints.

78. Alternate for Stainless

Republic Steel Corp.—12-page illustrated booklet "A Guide to Type 430 Stainless Steels as Alternates of 18-8 Series" is intended to help manufacturers affected by defense restrictions on chrome-nickel stainless steel. Booklet describes type 430 stainless and its modifications in comparison with types 302 and 304. Drawing, forming, welding and polishing information is given.

79. Antirust Wrapping

Nox-Rust Chemical Corp.—18-page illustrated pamphlet entitled, "The Nox-Rust Vapor Wrapper 'How' Book," presents information on company's corrosion-preventive vapor wrapping for metal parts and machinery. Typical applications as used by other companies are shown, and data on grades and length of protection are tabulated. List of rules for obtaining best results with wrapping completes issue.

80. Low Voltage Regulators

General Electric Co.—20-page publication GEC-795 describes features of redesigned single-phase Inductrols, low-voltage dry type induction voltage regulators. Application and operation information and data showing operating connections of equipment for 3 to 240 kva circuits is included.

81. Brass Nuts

Fischer Special Mfg. Co.—Styles, specifications and part numbers of standard line of brass nuts, odd size nuts, spark plug terminals, battery nuts and lighting fixture nuts are detailed in 15-page booklet entitled, "The Fischer File of Fischer Turned Brass Nuts." Dimensional line drawings on all styles are shown.

82. Broaching Machines

Cincinnati Milling Machine Co.—4-page illustrated data sheet No. M-1709-1 presents general specifications and dimensional drawings of No. 3-30 to 10-66 duplex vertical Hydro-Broach machines. Also included is information on standard and extra equipment and oil requirements.

83. Ash Handling Systems

Beaumont Birch Co.—Illustrated booklet gives detailed information on both hydraulic and pneumatic ash and flyash handling systems. It discusses elements and advantages of various systems and disposal schemes such as pumping to fill area, pumping to storage sump or dewatering bin for ash removal. Schematic drawings and diagrams are included.

84. Flexible Shafting

Elliott Mfg. Co.—Form 207 is 8-page pamphlet illustrating and describing line of flexible shafting available in 108 types and sizes with cores of 3/16 to 1½-in. diameters. Torque ratings for various size cores are tabulated. Shafting is used to replace miter or spur gears, get around obstacles, connect parts with relative movement or synchronize two movements.

85. Ball Bearing Hoists

Clyde Iron Works, Inc.—4-page illustrated data sheet MP 37-R covers Frame 4 gasoline, electric and diesel hoists with one, two and three drums. Outstanding features and specifications are detailed.

86. Industrial Truck Care

Baker-Raulang Co., Baker Industrial Truck Div.—14-page illustrated bulletin 2100, "Care and Maintenance of Industrial Trucks," pictorially shows 51 points which should receive periodic attention. Careful truck operation, avoidance of overloading and establishing and observing preventive maintenance program are listed as basis for sound maintenance program.

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87. Hydraulic Press

Ross & Co.—Details of 20-ton hydraulic press for assembling, broaching, crimping, drawing, forming, laminating, riveting, staking and other operations are given in 4-page illustrated bulletin "For Shop, Tool Room and Production Line."

88. Automatic Screw Machines

Cleveland Automatic Machine Co.—8-page illustrated brochure describes features and gives performance information on Dialmatic model AB single spindle bar and chucking machines. Bar machines have 2½ and 3-in. capacities, and while in operation as chucking machine, swing is 6 in. Machine has 112 spindle speeds from 24 to 1820 rpm.

89. Motor Generators

Hanson-Van Winkle-Munning Co.—18-page illustrated bulletin G-102 offers technical data on low voltage, direct current motor generator sets for electroplating, electrocleaning, anodizing, manodizing, electropolishing, electrocoloring, electrotyping, electroforming, metals refining and electrolytic production of chemicals. Approximate dimensions and weights of 6-v induction and synchronous motor generator sets are tabulated.

90. Forgings

Drop Forging Association — How hot-working improves properties of metals is covered in detail in 60-page illustrated booklet "Metal Quality". Subjects covered include importance of correctly proportioned combination of physical properties, forging quality steels, forging with closed impression dies, structural characteristics and properties, advantages and the forging engineer.

91. Grinding Wheel Bond

Chicago Wheel & Mfg. Co.—4-page pocket-size folder No. 2035 describes vitrified silicon carbide grinding wheel bond XL. Application and advantages of using XL-bonded wheels for tungsten carbide tool grinding, plus specifications of most popular straight and cup wheel sizes for rough and finish grinding are included.

92. Stud Threader

Kent Machine Co.—Description and specifications are given in illustrated data sheet on the "Automatic High Speed Stud Threader" available in ½ and 1-in. models. The former is powered by 2-hp motor and latter by a 3-hp motor, both easily accessible, yet protected from foreign matter.

93. Chain Drives & Conveyors

Chain Belt Co.—32-page illustrated pocket-size bulletin "Installation, Operation and Maintenance of Chain Drives and Conveyors" is intended for those who design, install, maintain and operate such equipment.

94. Optical Follower

Boeckeler Instrument Co.—4-page illustrated bulletin offers detailed information on Boeckeler optical follower, a duplicating instrument designed for attachment to Bridgeport and other knee type milling machines to convert them to efficient jig borers. Principle involves visually following template for duplication on workpiece.

95. Oxygen Recorder

Hays Corp. — 16-page illustrated bulletin 51-829 on Magno-Therm oxygen recorders is divided into five sections: Introduction, with application table; explanation of how analysis is made; diagrammatic explanation of operation; operation of various gas sampling systems used with instrument; discussion of results obtained in several installations.

96. Creep Stress Data

Babcock & Wilcox Tube Co.—Data sheet TDC 102-F gives technical information on creep for number of tubing steels. Data are given for rates of 1 per cent elongation in 10,000 and 100,000 hours at temperatures from 800 to 1500° F for 16 popular carbon, intermediate alloy and stainless steels.

97. Thread Rolling Machine

Carl Hirschmann Co.—A Swiss developed precision machine for cold rolling threads is fully described in 8-page illustrated 8¼ x 12-in. booklet.

98. Tension Load Cell

Baldwin-Lima-Hamilton Corp. — Bulletin 325 on Type P SR-4 tension load cell illustrates and gives specifications for load cells of four capacities between 10,000 and 100,000 lb. These cells are based on use of SR-4 bonded resistance wire strain gages for load measurement.

99. Beta Ray Gage

Industrial Nucleonics Corp.—4-page illustrated bulletin BG-1 presents information on operation, construction, application and servicing of model BG-1 beta ray gage used for production line inspection of steel, aluminum, brass, rubber, plastics, paper and coated textiles. Gage utilizes radioactive materials in determining weight and thickness variations of these materials.

100. Mobile Cranes

R. G. Le Tourneau Inc.—Versatility of mobile Tournacrane in lifting, carrying and spotting operations is illustrated in 14-page brochure entitled "Tournacranes." Machine features positive independent steering, 90-degree turnability permitting 360-degree boom rotation and telescoping boom.

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12	32	52	72	92
13	33	53	73	93
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15	35	55	75	95
16	36	56	76	96
17	37	57	77	97
18	38	58	78	98
19	39	59	79	99
20	40	60	80	100

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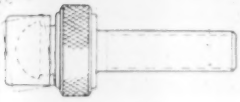
NEW! VLIER TOGGLE PADS

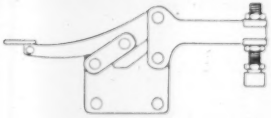
...tools with 1001 uses!

Pat. Appld. for

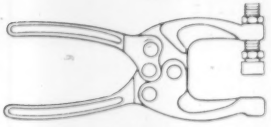


Toggle pad on Vlier Torque Thumb Screw

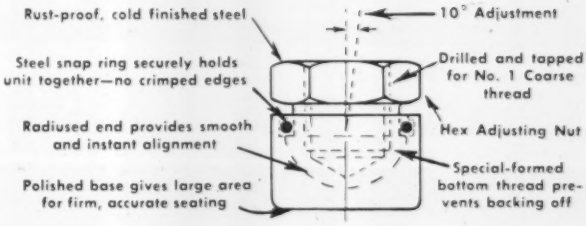
Toggle pad in use with a jack



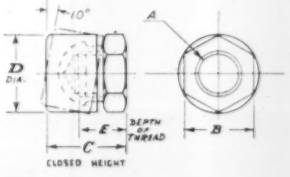
Toggle pad demonstrated on a toggle clamp



Toggle pad on toggle pliers


Rust-proof, cold finished steel
10° Adjustment
Steel snap ring securely holds unit together—no crimped edges
Drilled and tapped for No. 1 Coarse thread
Radiused end provides smooth and instant alignment
Hex Adjusting Nut
Special-formed bottom thread prevents backing off
Polished base gives large area for firm, accurate seating

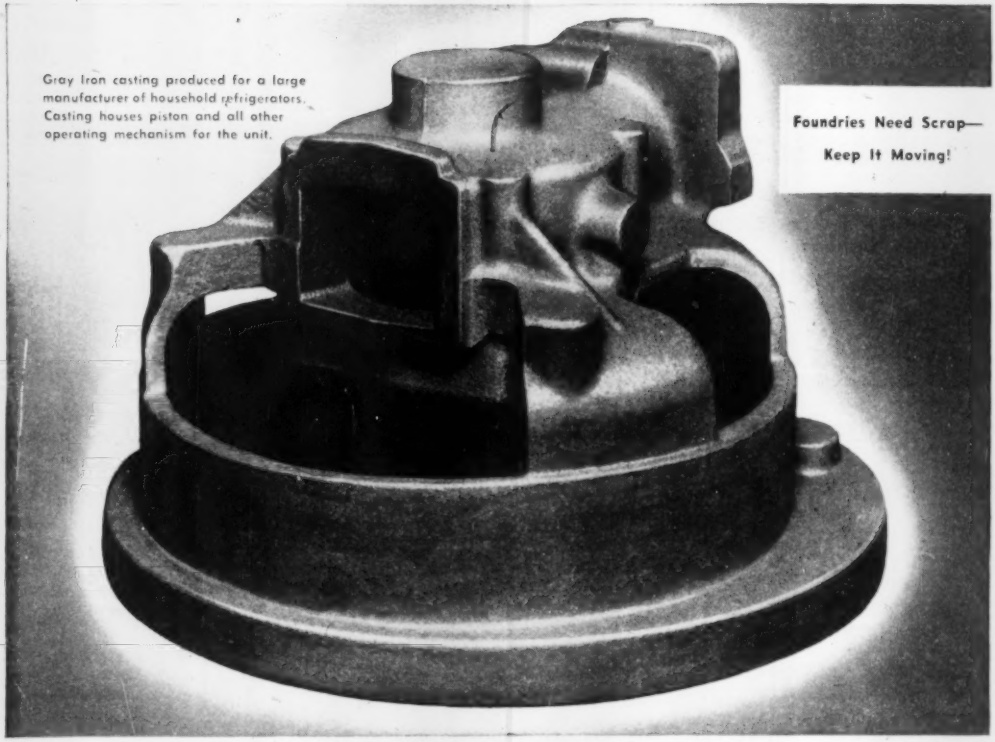
This latest addition to the Vlier line of tool specialties (Torque Thumb Screws, Spring Plungers, Spring Stops and Fixture Keys) fills a great need among all types of industries. In fact, wherever clamping is done, the Vlier Toggle Pads are practical necessities. These tools are designed to operate with almost any type of clamp—some of which are shown on this page—and they insure solid, secure holding because of their self-aligning and leveling feature. The pad base has a 10° movement for permitting adaption to uneven or off-angle surfaces. Each tool has a "jamming" feature to prevent loosening during work, yet it is easily removed. All Vlier pads are made of the finest cold finished steel and accurately machined for trouble-free performance. See these inexpensive but necessary tools today—they save real money on production lines. Your nearby Vlier representative will be happy to demonstrate them.



ITEM No.	A	B	C	D	E
P-300	1 4-20	1 2 Hex	5 8	5 8	13 32
P-302	5 16-18	9 16 "	11 16	11 16	27 64
P-304	3 8-16	5 8 "	3 4	3 4	1 2
P-306	1 2-13	3 4 "	7 8	7 8	17 32
P-308	5 8-11	7 8 "	15 16	1	9 16

VLIER MANUFACTURING CO.

4552 Beverly Blvd., Los Angeles 4, Calif.
Phones: GLadstone 2775 — 2941



Gray Iron casting produced for a large manufacturer of household refrigerators. Casting houses piston and all other operating mechanism for the unit.

Foundries Need Scrap—
Keep It Moving!

Consider all the *"angles"* and you'll choose GRAY IRON

GRAY IRON Characteristics Include:

- Castability
- Rigidity
- Low Notch Sensitivity
- Wear Resistance
- Heat Resistance
- Corrosion Resistance
- Durability
- Vibration Absorption
- Machinability
- Wide Strength Range

Note the complex design and numerous "angles" in the Gray Iron casting shown above. Then figure the cost of producing this part by fabricating or joining methods. No wonder Gray Iron's castability made it the logical and economical choice for this application.

There are other advantages, too. Gray Iron provides a dense, rigid structure, with excellent damping qualities. On operating surfaces, Gray Iron takes an excellent mirror-like finish.

Consider all the "angles"—including the advantageous characteristics listed here—and you, too, will wisely *choose Gray Iron.*

Make It Better With Gray Iron

Second largest industry in the Metal-working field

GRAY IRON FOUNDERS' SOCIETY, INC.

NATIONAL CITY-E. 6th BLDG., CLEVELAND 14, OHIO

The Market Outlook

EVERY pound of steel, copper and aluminum produced in the country goes under Controlled Materials Plan allocation beginning fourth quarter. Extension of CMP to include all classes of consumers of these three critical metals, announced last week, comes as no surprise. But import of the action is not immediately apparent. In some trade circles the move is seen as at least adding temporarily to the existing confusion attending CMP distrubution of steel. On the other hand, some authorities feel it will contribute a constructive influence for the longer term in the direction of supply-demand balance.

ADJUSTMENTS—Indications are that the broadening of CMP to include the consumer durable goods industries will necessitate some adjustments in steel mill schedules for fourth quarter. Extent of these is uncertain. The view prevailing is that the new consumer goods CMP ticket holders will be restricted to supplies within the limits of the tonnage currently available to them in the so-called "free" pool. In such event, the newly certified tonnage should not necessarily cut into that already earmarked for essential civilian lines and military consumption.

BALANCE—Hope for achieving supply-demand balance in steel during fourth quarter has just about faded out in official Washington. All the signs now point to just as much confusion in steel distribution during the closing quarter of the year as is being experienced currently. In fact, the general view now held is that it will be first quarter before even a semblance of balance will be possible. Allocation authorities right now are being flooded with requests for fourth-quarter tonnage which cannot be possibly satisfied.

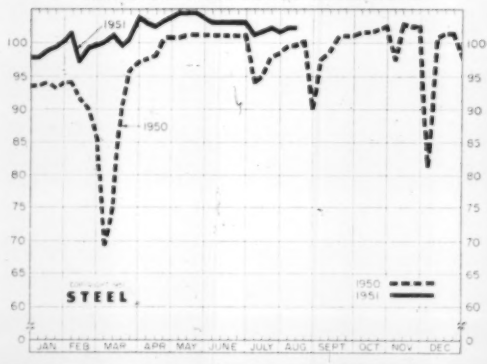
SUPPLY—Expectations are while output of finished steel will be greater in fourth quarter, demand will exceed supply by a substantial margin. Government authorities are hopeful over-allotments for the period will not exceed supply by 10 per cent, this hope, in part, being based on expectation some consumers may not specify to full extent of allotments. Further, cutbacks in consumer goods production for various reasons are thought likely to result in some easing off in demand pressure. In this connection, manufacturers of consumer goods who have had to rely for their supplies on the "free" pool, and who are now being brought under the CMP umbrella, must apply for allocation tickets by Aug. 15.

PRODUCTS— As matters now stand the steelmakers are booked up over remainder of the year on all major products. Relatively little capacity is still open in what, up to now, has been regarded as the "free area." In certain products, notably plates, this area is very small. New structural orders are spotty, lull in new business in part being due to the latest government regulations affecting building, which in one phase amount to prohibition of most new construction starts until Oct. 1. Sheets and strip are in increasing demand with the vacation season on the wane. Some electrical sheet order cancellations are noted, reflecting letdown in consumer goods, but this is the only area of the sheet picture where any easing in demand pressure is noted. Barmakers are being pressed for tonnage by regular customers that were squeezed out of September schedules by CMP over-allotments. Pig iron also is more active with foundry vacation periods ending. Scrap is moving more actively but serious winter shortage looms with consumers unable to materially enlarge inventories.

PRODUCTION—Steel ingot output holds above the 2-million-ton-weekly mark. The national ingot rate last week held at 102 per cent of capacity.

PRICES— Stability marks price schedules in all areas of the steel and related markets. Most recent adjustment in prices involved tool steels. STEEL's weighted index on finished steel holds at 171.92 as does the arithmetical composite at $106.32.

NATIONAL STEELWORKS OPERATIONS



DISTRICT INGOT RATES

Percentage of Capacity Engaged at Leading Production Points

	Week Ended Aug. 11	Change	Same Week 1950	Same Week 1949
Pittsburgh	98.5	-3*	101.5	78
Chicago	105	2*	102	88.5
Mid-Atlantic	100.5	6.5	98	73.5
Youngstown	106	1	106	88
Wheeling	98	6.5	92	92
Cleveland	104	1*	97.5	98.5
Buffalo	104	0	104	96
Birmingham	100	0	100	100
New England	92	0	98	58
Cincinnati	101	5	103	91
St. Louis	90.5	4.5	86	53
Detroit	103	1	104	100
Western	103	1.5	98	77
Estimated national rate	102	0	99.5	82.5

Based on weekly steelmaking capacity of 1,999,034 tons for 1951; 1,928,721 tons for second half, 1950; 1,906,268 tons for first half, 1950; 1,843,516 tons for 1949.

*Change from revised rate for preceding week.

The Metalworking Outlook—p. 37 Production-Engineering News—p. 73

Composite Market Averages

	Aug. 9 1951	Week Ago	Month Ago	Year Ago	5 Yrs. Ago
FINISHED STEEL INDEX, Weighted:					
Index (1935-39 av. = 100)	171.92	171.92	171.92	156.99	112.04
Index, in cents per lb.	4.657	4.657	4.657	4.253	3.035
ARITHMETICAL PRICE COMPOSITES:					
Finished Steel, NT	$106.32	$106.32	$106.32	$94.86	$64.45
No. 2 Fdry. Pig Iron, GT	52.54	52.54	52.54	46.50	28.17
Basic Pig Iron, GT	52.16	52.16	52.16	45.97	27.60
Malleable Pig Iron, GT	53.27	53.27	53.27	47.49	28.79
Steelmaking Scrap, GT	44.00	44.00	44.00	38.28	19.17

Weighted finished steel index based on average shipments and Pittsburgh district prices of the following 14 representative products during 3-year base period 1935-39: Structural shapes, plates, rails, hot-rolled and cold-finished bars, pipe, wire, nails, tin plate, hot and cold-rolled sheets, galvanized sheets, hot and cold-rolled strip. For complete explanation see STEEL, Sept. 18, 1949, p. 54.

Arithmetical steel price composite based on same products as the weighted finished steel index with the exception of rails, cold-finished bars, galvanized sheets and hot-rolled strip.

Basic and No. 2 foundry pig iron composites are based on average prices at Pittsburgh, Bethelem, Birmingham, Buffalo, Chicago, Cleveland, Granite City, Youngstown, Malleable composite based on same points except Birmingham.

Steelmaking scrap composite based on average prices of No. 1 heavy melting steel at Pittsburgh, Chicago and Philadelphia.

Comparison of Prices

Comparative prices by districts, in cents per pound except as otherwise noted. Delivered prices based on nearest production point.

FINISHED MATERIALS

	Aug. 9 1951	Week Ago	Month Ago	Year Ago	5 Yrs Ago
Bars, H.R., Pittsburgh	3.70	3.70	3.70	3.45	2.50
Bars, H.R., Chicago	3.70	3.70	3.70	3.45	2.50
Bars, H.R., del. Philadelphia	4.29	4.29	4.29	3.93	2.86
Bars, H.F., Pittsburgh	4.55	4.55	4.55	4.10-15	2.80
Shapes, Std., Pittsburgh	3.65	3.65	3.65	3.40	2.35
Shapes, Std., Chicago	3.65	3.65	3.65	3.40	2.35
Shapes, del. Philadelphia	3.91	3.91	3.91	3.46	2.48
Plates, Pittsburgh	3.70	3.70	3.70	3.50	2.50
Plates, Chicago	3.70	3.70	3.70	3.50	2.50
Plates, Coatesville, Pa.	4.15	4.15	4.15	3.90	2.90
Plates, Sparrows Point, Md.	3.70	3.70	3.70	3.50	2.50
Plates, Claymont, Del.	4.15	4.15	4.15	3.60	2.50
Sheets, H.R., Pittsburgh	3.60-75	3.60-75	3.60-75	3.35	2.425
Sheets, H.R., Chicago	3.60	3.60	3.60	3.35	2.425
Sheets, C.R., Pittsburgh	4.35	4.35	4.35	4.10	3.275
Sheets, C.R., Chicago	4.35	4.35	4.35	4.10	3.275
Sheets, C.R., Detroit	4.50	4.55	4.55	4.30	3.375
Sheets, Galv., Pittsburgh	4.80	4.80	4.80	4.40	4.05
Strip, H.R., Pittsburgh	3.75-4.00	3.75-4.00	3.75-4.00	3.50	2.55
Strip, H.R., Chicago	3.50	3.50	3.50	3.25	2.35
Strip, C.R., Pittsburgh	4.65-5.35	4.65-5.35	4.65-5.35	4.15-50	3.15
Strip, C.R., Chicago	4.00	4.00	4.00	4.00	3.15
Strip, C.R., Detroit	4.85-5.60	4.85-5.60	4.85-5.60	4.35-95	3.15
Wire, Basic, Pittsburgh	4.85-5.10	4.85-5.10	4.85-5.10	4.50	3.05
Nails, Wire, Pittsburgh	5.90-6.20	5.90-6.20	5.90-6.20	5.50	3.75
Tin plate, box, Pittsburgh	$8.70	$8.70	$8.70	$7.50	$5.25

SEMIFINISHED

Billets, forging, Pitts. (NT)	$66.00	$66.00	$66.00	$63.00	$47.00
Wire rods, ½-⅝", Pitts.	4.10-30	4.10-30	4.10-30	3.85	2.30

PIG IRON, Gross Ton

Bessemer, Pitts.	$53.00	$53.00	$53.00	$47.50	$29.00
Basic, Valley	52.00	52.00	52.00	46.00	28.00
Basic, del. Phila.	56.19	56.19	56.19	50.59	29.93
No. 2 Fdry., Pitts.	52.50	52.50	52.50	46.50	28.50
No. 2 Fdry., Chicago	52.50	52.50	52.50	46.50	28.50
No. 2 Fdry., Valley	52.50	52.50	52.50	46.50	28.50
No. 2 Fdry., Del., Phila.	56.99	56.99	56.99	50.49	30.43
No. 2 Fdry., Birm.	48.88	48.88	48.88	42.38	24.88
No. 2 Fdry. (Birm.) del. Cin.	55.33	55.33	55.33	49.08	28.94
Malleable, Valley	52.50	52.50	52.50	46.50	28.50
Malleable, Chicago	52.50	52.50	52.50	46.50	28.50
Charcoal, Lyles, Tenn.	66.00	66.00	66.00	60.00	33.00
Ferromanganese, Etna, Pa.	188.00	188.00	188.00	175.00	140.00*

* Delivered, Pittsburgh.

SCRAP, Gross Ton (including broker's commission)

No. 1 Heavy Melt., Pitts.	$45.00	$45.00	$45.00	$41.00	$20.00
No. 1 Heavy Melt., E. Pa.	43.50	43.50	43.50	36.75	18.75
No. 1 Heavy Melt., Chicago	43.50	43.50	43.50	38.00	18.75
No. 1 Heavy Melt., Valley	45.00	45.00	45.00	41.25	20.00
No. 1 Heavy Melt., Cleve.	44.00	44.00	44.00	40.75	19.50
No. 1 Heavy Melt., Buffalo	44.00	44.00	44.00	36.75	19.25
Rails, Rerolling, Chicago	52.50	52.50	52.50	50.125	22.25
No. 1 Cast, Chicago	49.00	49.00	49.00	44.00	20.00

* F. o.b. shipping point.

COKE, Net Ton

Beehive, Furn. Connlsvl.	$14.75	$14.75	$14.75	$14.25	$8.75
Beehive, Fdry., Connlsvl.	17.50	17.50	17.50	15.50	9.50
Oven, Fdry., Chicago	23.00	23.00	23.00	21.00	14.35

NONFERROUS METALS

Copper, del. Conn.	24.50	24.50	24.50	22.50	14.375
Zinc, E. St. Louis	17.50	17.50	17.50	13.00	8.25
Lead, St. Louis	16.50	16.50	16.50	11.80	8.10
Tin, New York	103.00	103.00	106.00	103.50*	52.00
Aluminum, del.	19.00	19.00	19.00	17.50	15.00
Antimony, Laredo, Tex.	42.00	42.00	42.00	24.50	14.50
Nickel, refinery, duty paid	56.50	56.50	56.50	48.00	35.00

PIG IRON

F.o.b. furnace prices quoted under GCPR as reported to STEEL. Minimum delivered prices do not include 3% federal tax. Key to producing companies published on second following page.

PIG IRON, Gross Ton

	Basic	No. 2 Foundry	Malleable	Bessemer
Bethlehem,Pa. B2	$54.00	$54.50	$55.00	$55.50
Brooklyn,N.Y., del.		58.69	59.46	
Newark,del.	56.74	57.24	57.74	58.24
Philadelphia,del.	56.49	56.99	57.49	57.99
Birmingham District				
AlabamaCity,Ala. R2	48.38	48.88		
Birmingham R2	48.38	48.88		
Birmingham S8	48.38	48.88		
Woodward,Ala. W15	48.38	48.88		
Cincinnati, del.		55.33		
Buffalo District				
Buffalo R2	52.00	52.50	53.00	
Buffalo H1	52.00	52.50	53.00	
Tonawanda,N.Y. W12	52.00	52.50	53.00	
No.Tonawanda,N.Y. T9		52.50	53.00	
Boston, del.	61.63	62.13	62.63	
Rochester,N.Y., del.	54.74	55.24	55.74	
Syracuse,N.Y.,del.	55.72	56.22	56.72	
Chicago District				
Chicago I-3	52.00	52.50	52.50	53.00
Gary,Ind. U5	52.00		52.50	
Indiana Harbor Ind. I-2	52.00		52.50	
So.Chicago,Ill. W14	52.00	52.50	52.50	
So.Chicago,Ill. Y1	52.00	52.50	52.50	
So.Chicago,Ill. U5	52.00		52.50	53.00
Milwaukee, del.	53.97	54.47	54.47	54.97
Muskegon,Mich., del.		58.20	58.20	
Cleveland District				
Cleveland A7	52.00	52.50	52.50	53.00
Cleveland R2	52.00	52.50	52.50	
Akron, del. from Cleve.	54.49	54.99	54.99	55.49
Lorain,O. N3	52.00			53.00
Duluth I-3			52.50	
Erie,Pa. I-3	52.00	52.50	52.50	53.00
Everett,Mass. E1		55.25	55.75	
Fontana,Calif. K1	58.00	58.50		
Geneva,Utah G1	52.00	52.50		
Seattle,Tacoma,Wash. del.		60.35		
Portland,Oreg.,del.		60.35		
LosAngeles,SanFrancisco,del.	59.85	60.35		
GraniteCity,Ill. G4	53.00	54.40	54.90	
St.Louis,del. (Inc. tax)	54.68	55.16	55.66	
Ironton,Utah C11	52.00	52.50		
LoneStar,Tex. I6	48.00	*48.50	48.50	
Minnequa,Colo. C10	54.00	55.00	55.00	
Pittsburgh District				
NevilleIsland,Pa. P6		52.50	52.50	53.00
Pitts.,N.&S. sides, Ambridge, Aliquippa,del.		53.74	53.74	54.24
McKeesRocks, del.		53.49	53.49	53.99
Lawrenceville, Homestead, McKeesport,Monaca del.		54.00	54.00	54.50
Verona,del.		54.48	54.48	54.98
Brackenridge,del.		54.72	54.72	55.22
Bessemer,Pa. U5	52.00		52.50	53.00
Clairton,Rankin,So.Duquesne,Pa. U5	52.00			
McKeesport,Pa. N3	52.00			53.00
Monessen,Pa. P7	54.00			
Sharpsville,Pa. S6			52.50	53.00
Steelton,Pa. B2	54.00	54.50	55.00	55.50
Swedeland,Pa. A3	56.00	56.50	57.00	57.50
Toledo,O. I-3	52.00	52.50	52.50	53.00
Cincinnati, del.	57.21	57.71		58.21
Troy,N.Y. R2	54.00	54.50	55.00	55.50
Youngstown District				
Hubbard,O. Y1	52.00	52.50	52.50	
Youngstown Y1	52.00	52.50	52.50	
Youngstown U5	52.00			53.00
Mansfield,O. del.	56.43	56.93	56.93	57.43

* Low phos, southern grade.

PIG IRON DIFFERENTIALS

Silicon: Add 50 cents per ton for each 0.25% Si over base grade, 1.75-2.25%, except on low phos iron on which base is 1.75-2.00%.

Phosphorus: Deduct 38 cents per ton for P content of 0.70% and over.

Manganese: Add 50 cents per ton for each 0.50% manganese over 1%, or portion thereof.

Nickel: Under 0.50% no extra; 0.50-0.74%, incl., add $2 per ton and each additional 0.25%, add $1 per ton.

BLAST FURNACE SILVERY IRON, Gross Ton

(Base 6.00-6.50% silicon; add $1.50 for each 0.5% Si)	
Jackson,O. G12, J1	$62.50
Buffalo H1	63.75

ELECTRIC FURNACE SILVERY PIG IRON, Gross Ton

(Base 14.01-14.50% silicon; add $1 for each 0.5% Si to 18%, $1 for each 0.5% Mn over 1%. $1 for each 0.045% max. P)	
	$88.00
NiagaraFalls,N.Y. P10	92.50
Keokuk,Iowa, Openhearth & Fdry., frt. allowed K2	95.50
Keokuk, OH & Fdry., 12½ lb piglets, 16% Si, frt. allowed K2	92.50
Wenatchee, Wash., O.H. & Fdry., frt. allowed K2	

CHARCOAL PIG IRON, Gross Ton

(Low phos semi-cold blast; differential charged for silicon over base grade; also for hard chilling iron Nos. 5 & 6)	
Lyles,Tenn. T3	$66.00

LOW PHOSPHORUS PIG IRON, Gross Ton

Cleveland, intermediate, A7	$57.00
Steelton,Pa. B2	60.00
Philadelphia, delivered	63.12
Troy,N.Y. R2	60.00

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Semifinished and Finished Steel Products

Mill prices quoted under GCPR as reported to STEEL, Aug. 9, 1951, cents per pound except as otherwise noted. Changes shown in italics. Code numbers following mill points indicate producing company; key on next two pages.

INGOTS, Carbon, Forging (NT)
Fontana,Calif. K1 ... $72.00
Munhall,Pa. U5 ... 52.00

INGOTS, Alloy (NT)
Detroit R7 ... $54.00
Fontana,Calif., K1 ... 80.00
Houston,Tex. S5 ... 62.00
Midland,Pa. C18 ... 54.00
Munhall,Pa. U5 ... 54.00

BILLETS, BLOOMS & SLABS
Carbon, Rerolling (NT)
Bessemer,Pa. U5 ... $56.00
Clairton,Pa. U5 ... 56.00
Ensley,Ala. T2 ... 56.00
Fairfield,Ala. T2 ... 56.00
Fontana,Calif. K1 ... 56.00
Gary, Ind. U5 ... 56.00
Johnstown,Pa. B2 ... 56.00
Lackawanna,N.Y. B2 ... 56.00
Munhall,Pa. U5 ... 56.00
So.Chicago,Ill. U5 ... 56.00
So.Duquesne,Pa. U5 ... 56.00

Carbon, Forging (NT)
Bessemer,Pa. U5 ... $66.00
Buffalo R2 ... 66.00
Canton,O. R2 ... 66.00
Clairton,Pa. U5 ... 66.00
Cleveland R2 ... 66.00
Conshohocken,Pa. A3 ... 73.00
Detroit R7 ... 69.00
Ensley,Ala. T2 ... 66.00
Fairfield, Ala. T2 ... 66.00
Fontana,Calif. K1 ... 85.00
Gary,Ind. U5 ... 66.00
Geneva,Utah G1 ... 66.00
Houston,Tex. S5 ... 74.00
Johnstown,Pa. B2 ... 66.00
Lackawanna,N.Y. B2 ... 66.00
LosAngeles B3 ... 85.00
Munhall,Pa. U5 ... 66.00
Seattle B3 ... 85.00
So.Chicago R2,U5,W14 ... 66.00
So.Duquesne,Pa. U5 ... 66.00
So.SanFrancisco B3 ... 85.00

Alloy, Forging (NT)
Bethlehem,Pa. B2 ... $70.00
Buffalo R2 ... 70.00
Canton,O. R2 ... 70.00
Canton,O. (2)= T7 ... 66.00
Conshohocken,Pa. A3 ... 77.00
Detroit R7 ... 73.00
Fontana,Calif. K1 ... 89.00
Gary,Ind. U5 ... 70.00
Houston,Tex. S5 ... 78.00
Ind.Harbor,Ind. Y1 ... 70.00
Johnstown,Pa. B2 ... 70.00
Lackawanna,N.Y. B2 ... 70.00
LosAngeles B3 ... 90.00
Massillon,O. R2 ... 70.00
Midland,Pa. C18 ... 70.00
Munhall,Pa. U5 ... 70.00
So.Chicago R2,U5,W14 ... 70.00
So.Duquesne,Pa. U5 ... 70.00
Struthers,O. Y1 ... 70.00
Warren,O. C17 ... 70.00

ROUNDS, SEAMLESS TUBE (NT)
Canton,O. R2 ... $82.00
Cleveland R2 ... 82.00
Fontana,Calif. K1 ... 103.00
Gary,Ind. U5 ... 82.00
Massillon,O. R2 ... 82.00
So.Chicago,Ill. R2 ... 82.00
So.Duquesne,Pa. U5 ... 82.00

SHEET BARS (NT)
Fontana,Calif. K1 ... $89.00

SKELP
Aliquippa,Pa. J5 ... $3.45
Munhall,Pa. U5 ... 3.35
Warren,O. R2 ... 3.35
Youngstown, R2, U5 ... 3.35

WIRE RODS
AlabamaCity,Ala. R2 ... 4.10
Buffalo W12 ... 4.10
Cleveland A7 ... 4.10
Donora,Pa. A7 ... 4.10
Fairfield,Ala. T2 ... 4.10
Fontana,Calif. K1 ... 4.90
Houston,Tex. S5 ... 4.50
Johnstown,Pa. B2 ... 4.10
Joliet,Ill. A7 ... 4.10
LosAngeles B3 ... 4.90
Minnequa,Colo. C10 ... 4.35
Monessen,Pa. P7 ... 4.30
No.Tonawanda,N.Y. B11 ... 4.10
Pittsburg,Calif. C11 ... 4.75
Portsmouth,O. P12 ... 4.30
Roebling,N.J. R5 ... 4.20
So.Chicago,Ill. R2 ... 4.10
SparrowsPoint,Md. B2 ... 4.20
Sterling,Ill.(4)= N15 ... 4.10
Struthers,O. Y1 ... 4.10
Torrance,Calif. C11 ... 4.90
Worcester,Mass. A7 ... 4.40

SHEET STEEL PILING
Ind.Harbor,Ind. I-2 ... 4.45
Lackawanna,N.Y. B2 ... 4.45
Munhall,Pa. U5 ... 4.45
So.Chicago,Ill. U5 ... 4.45

STRUCTURALS
Carbon Steel Stand. Shapes
AlabamaCity,Ala. R2 ... 3.60
Aliquippa,Pa. J5 ... 3.65
Bessemer,Ala. T2 ... 3.65
Bethlehem,Pa. B2 ... 3.70
Clairton,Pa. U5 ... 3.65
Fairfield,Ala. T2 ... 3.65
Fontana,Calif. K1 ... 4.25
Gary,Ind. U5 ... 3.65
Geneva,Utah G1 ... 3.65
Houston,Tex. S5 ... 4.05
Ind.Harbor,Ind. I-2 ... 3.65
Johnstown,Pa. B2 ... 3.70
KansasCity,Mo. S5 ... 4.25
Lackawanna,N.Y. B2 ... 3.70
LosAngeles B3 ... 4.25
Minnequa,Colo. C10 ... 4.10
Munhall,Pa. U5 ... 3.65
Niles,Calif.(22)= P1 ... 4.85
Phoenixville,Pa. P1 ... 4.95
Portland,Oreg. O4 ... 4.50
Seattle B3 ... 4.30
So.Chicago,Ill. U5, W14 ... 3.65
So.SanFrancisco B3 ... 4.20
Torrance,Calif. C11 ... 4.25
Weirton,W.Va. W6 ... 3.90

Alloy Stand. Shapes
Clairton,Pa. U5 ... 4.35
Fontana,Calif. K1 ... 5.55
Munhall,Pa. U5 ... 4.35
So.Chicago,Ill. U5 ... 4.35

H.S., L.A. Stand. Shapes
Aliquippa,Pa. J5 ... 5.50
Bessemer,Ala. T2 ... 5.50
Bethlehem,Pa.(14)= B2 ... 5.50
Clairton,Pa. U5 ... 5.50
Fairfield,Ala. T2 ... 5.50
Fontana,Calif. K1 ... 6.10
Gary,Ind. U5 ... 5.50
Geneva,Utah G1 ... 5.50
Ind.Harbor,Ind. I-2 ... 5.50
Ind.Harbor,Ind. Y1 ... 6.00
Johnstown,Pa. B2 ... 5.50
Lackawanna,N.Y.(14)= B2 ... 5.50
LosAngeles B3 ... 6.05
Munhall,Pa. U5 ... 5.50
Seattle B3 ... 6.10
So.Chicago,Ill. U5 ... 5.50
So.SanFrancisco B3 ... 6.00
Struthers,O. Y1 ... 6.00

Wide Flange
Bethlehem,Pa. B2 ... 3.70
Clairton,Pa. U5 ... 3.65
Fontana,Calif. K1 ... 4.65
Lackawanna,N.Y. B2 ... 3.70
Munhall,Pa. U5 ... 3.65
So.Chicago,Ill. U5 ... 3.65

H.S. L.A. Wide Flange
Bethlehem,Pa. B2 ... 5.50
Lackawanna,N.Y. B2 ... 5.50
Munhall,Pa. U5 ... 5.45
So.Chicago,Ill. U5 ... 5.45

BEARING PILES
Munhall,Pa. U5 ... 3.65
So.Chicago,Ill. U5 ... 3.65

PLATES, High-Strength Low-Alloy
Aliquippa,Pa. J5 ... 5.65
Bessemer,Ala. T2 ... 5.65
Clairton,Pa. U5 ... 5.65
Cleveland J5, R2 ... 5.65
Conshohocken,Pa. A3 ... 5.90
Fairfield,Ala. T2 ... 5.65
Fontana,Calif.(30)= K1 ... 6.25
Gary,Ind. U5 ... 5.65
Geneva,Utah G1 ... 5.65
Ind.Harbor,Ind. I-2 ... 5.65
Ind.Harbor,Ind. Y1 ... 6.15
Johnstown,Pa. B2 ... 5.65
Munhall,Pa. U5 ... 5.65
Pittsburgh J5 ... 5.65
Seattle B3 ... 6.55
Sharon,Pa. S3 ... 5.70
So.Chicago,Ill. U5 ... 5.65
SparrowsPoint,Md. B2 ... 5.65
Warren,O. R2 ... 5.65
Youngstown Y1 ... 6.15

PLATES, Open-Hearth Alloy
Claymont,Del. C22 ... 4.85
Coatesville,Pa. L7 ... 5.25
Conshohocken,Pa. A3 ... 5.95
Fontana,Calif. K1 ... 5.70
Gary,Ind. U5 ... 4.75
Johnstown,Pa. B2 ... 4.75
Munhall,Pa. U5 ... 4.75
Sharon,Pa. S3 ... 5.20
So.Chicago,Ill. U5 ... 4.75
SparrowsPoint,Md. B2 ... 4.75

FLOOR PLATES
Cleveland J5 ... 4.75
Conshohocken,Pa. A3 ... 4.75
Harrisburg,Pa. C5 ... 5.95
Ind.Harbor,Ind. I-2 ... 4.75
Munhall,Pa. U5 ... 4.75
So.Chicago,Ill. U5 ... 4.75

PLATES, Ingot Iron
Ashland,c.l.(15)= A10 ... 3.95
Ashland,lcl(15)= A10 ... 4.45
Cleveland,c.l. R2 ... 4.30
Warren,O.,c.l. R2 ... 4.30

PLATES, Carbon Steel
AlabamaCity,Ala. R2 ... 3.70
Aliquippa,Pa. J5 ... 3.70
Ashland,Ky.(15)= A10 ... 3.70
Bessemer,Ala. T2 ... 3.70
Clairton,Pa. U5 ... 3.70
Claymont,Del. C22 ... 4.15
Cleveland J5, R2 ... 3.70
Coatesville,Pa. L7 ... 4.15
Conshohocken,Pa. A3 ... 4.15
Fairfield,Ala. T2 ... 3.70
Fontana,Calif.(30)= K1 ... 4.30
Gary,Ind. U5 ... 3.70
GraniteCity,Ill. G4 ... 4.40
Geneva,Utah G1 ... 3.70
Harrisburg,Pa. C5 ... 4.95
Houston,Tex. S5 ... 4.10
Ind.Harbor,Ind. I-2, Y1 ... 3.70
Johnstown,Pa. B2 ... 3.70
Lackawanna,N.Y. B2 ... 3.70
Minnequa,Colo. C10 ... 4.50
Munhall,Pa. U5 ... 3.70
Pittsburgh J5 ... 3.70
Sharon,Pa. S3 ... 3.95
So.Chicago,Ill. U5, W14 ... 3.70
SparrowsPoint,Md. B2 ... 3.70
Steubenville,O. W10 ... 3.70
Warren,O. R2 ... 3.70
Weirton,W.Va. W6 ... 4.00
Youngstown R2, U5, Y1 ... 3.70

PLATES, Carbon A.R.
Fontana,Calif. K1 ... 5.45
Geneva,Utah G1 ... 4.85

PLATES, Wrought Iron
Economy,Pa. B14 ... 8.60

BARS, Hot-Rolled Carbon
AlabamaCity,Ala. R2 ... 3.70
Aliquippa,Pa. J5 ... 3.70
Alton,Ill.(4)= LI ... 3.95
Atlanta,Ga. A11 ... 4.25
Bessemer,Ala. T2 ... 3.70
Buffalo R2 ... 3.70
Canton,O. R2 ... 3.70
Clairton,Pa. U5 ... 3.70
Cleveland R2 ... 3.70
Detroit R7 ... 3.85
Emeryville, Calif. J7 ... 4.45
Fairfield,Ala. T2 ... 3.70
Fontana,Calif. K1 ... 4.40
Gary,Ind. U5 ... 3.70
Houston,Tex. S5 ... 4.10
Ind.Harbor,Ind. I-2, Y1 ... 3.70
Johnstown,Pa. B2 ... 3.70
KansasCity,Mo. S5 ... 4.30
Lackawanna,N.Y. B2 ... 3.70
LosAngeles B3 ... 4.40
Milton,Pa. B6 ... 4.20
Minnequa,Colo. C10 ... 4.15
Niles,Calif. P1 ... 5.05
N.Tonawanda,N.Y. B11 ... 3.70
Pittsburg,Calif. C11 ... 4.40
Pittsburgh J5 ... 3.70
Portland,Oreg. O4 ... 4.65
Seattle B3, N14 ... 4.45
So.Chicago R2,U5,W14 ... 3.70
So.Duquesne,Pa. U5 ... 3.70
So.SanFran.,Cal. B3 ... 4.45
Struthers,O. Y1 ... 3.70
Torrance,Calif. C11 ... 4.40
Weirton,W.Va. W6 ... 3.85
Youngstown R2, U5 ... 3.70

BAR SIZE ANGLES; S. SHAPES
Aliquippa,Pa. J5 ... 3.70
Atlanta A11 ... 4.25
Johnstown,Pa. B2 ... 3.70
Lackawanna,N.Y. B2 ... 3.70
Niles,Calif. P1 ... 5.05
Portland,Oreg. O4 ... 4.65
SanFrancisco S7 ... 4.85

BAR SIZE ANGLES;H.R. CARBON
Bethlehem,Pa. B2 ... 3.90

BARS, Hot-Rolled Alloy
Bethlehem,Pa. B2 ... 4.30
Buffalo R2 ... 4.30
Canton,O. R2 ... 4.30
Canton,O.(29)= T7 ... 3.95
Clairton,Pa. U5 ... 4.30
Detroit R7 ... 4.45
Ecorse,Mich. G5 ... 4.65
Fontana,Calif. K1 ... 5.35
Gary,Ind. U5 ... 4.30
Houston,Tex. S5 ... 4.70
Ind.Harbor,Ind. I-2, Y1 ... 4.30
Johnstown,Pa. B2 ... 4.30
Kansas City,Mo. S5 ... 4.90
Lackawanna,N.Y. B2 ... 4.30
LosAngeles B3 ... 5.35
Massillon,O. R2 ... 4.30
Midland,Pa. C18 ... 4.30
So.Chicago R2,U5,W14 ... 4.30
S.Duquesne,Pa. U5 ... 4.30
Struthers,O. Y1 ... 4.30
Warren,O. C17 ... 4.30
Youngstown U5 ... 4.30

BAR SHAPES, Hot-Rolled Alloy
Clairton,Pa. U5 ... 4.55
Gary, Ind. U5 ... 4.55
Youngstown U5 ... 4.55

BARS & SMALL SHAPES, H. R., High-Strength Low-Alloy
Aliquippa,Pa. J5 ... 5.55
Bessemer,Ala. T2 ... 5.55
Bethlehem,Pa. B2 ... 5.55
Clairton,Pa. U5 ... 5.55
Cleveland R2 ... 5.55
Fairfield,Ala. T2 ... 5.55
Fontana,Calif., K1 ... 6.60
Gary,Ind. U5 ... 5.55
Ind.Harbor,Ind. I-2 ... 5.55
IndianaHarbor,Ind. Y1 ... 6.05
Johnstown,Pa. B2 ... 5.55
Lackawanna,N.Y. B2 ... 5.55
LosAngeles B3 ... 6.25
Pittsburgh J5 ... 5.55
Seattle B3 ... 6.30
So.Duquesne,Pa. U5 ... 5.55
SoSanFrancisco B3 ... 6.30
Struthers,O. Y1 ... 6.05
Youngstown U5 ... 5.55

BARS, Cold-Finished Carbon
Ambridge,Pa. W18 ... 4.55
BeaverFalls,Pa. M12,R2 ... 4.55
Buffalo B5 ... 4.60
Camden,N.J. P13 ... 5.00
Carnegie,Pa. C12 ... 4.55
Chicago W18 ... 4.55
Cleveland A7, C20 ... 4.55
Detroit P17 ... 4.70
Donora,Pa. A7 ... 4.55
Elyria,O. W8 ... 4.55
FranklinPark,Ill. N5 ... 4.55
Gary,Ind. R2 ... 4.55
GreenBay,Wis F7 ... 4.55
Hammond,Ind. I-2, M13 ... 4.55
Hartford,Conn. R2 ... 5.10
Harvey,Ill. B5 ... 4.55
LosAngeles R2 ... 6.00
Mansfield,Mass. B5 ... 5.10
Massillon,O. R2, R8 ... 4.55
Monaca,Pa. S17 ... 4.55
Newark,N.J. W18 ... 5.00
Plymouth,Mich. P5 ... 4.80
Pittsburgh J5 ... 4.55
Putnam,Conn. W18 ... 5.10
Readville,Mass. C14 ... 5.10
St.Louis,Mo. M5 ... 4.95
So.Chicago,Ill. W14 ... 4.55
SpringCity,Pa.(5)= K3 ... 5.00
Struthers,O. Y1 ... 4.55
Waukegan,Ill. A7 ... 4.55
Youngstown F3, Y1 ... 4.55

BARS, Cold-Finished Alloy
Ambridge,Pa. W18 ... 5.40
BeaverFalls,Pa. M12 ... 5.40
Bethlehem,Pa. B2 ... 5.40
Buffalo B5 ... 5.40
Camden,N.J. P13 ... 5.80
Canton,O. R2 ... 5.40
Canton,O.(29)= T7 ... 4.90
Carnegie,Pa. C12 ... 5.40
Chicago W18 ... 5.40
Cleveland A7 ... 5.45
Cleveland C20 ... 5.40
Detroit P17 ... 5.55
Donora,Pa. A7 ... 5.45
Elyria,O. W8 ... 5.40
Gary,Ind. R2 ... 5.40
Hammond,Ind. I-2, M13 ... 5.40
Hartford,Conn. R2 ... 5.85
Harvey,Ill. B5 ... 5.40
Lackawanna,N.Y. B2 ... 5.40
Mansfield,Mass. B5 ... 5.85
Massillon,O. R2,R8 ... 5.40
Midland,Pa. C18 ... 5.40
Monaca,Pa. S17 ... 5.40
Newark,N.J. W18 ... 5.75
Plymouth,Mich. P5 ... 5.60
So.Chicago,Ill. R2, W14 ... 5.40
Struthers,O. Y1 ... 5.40
Warren,O. C17 ... 5.40
Waukegan,Ill. A7 ... 5.45
Worcester,Mass. A7 ... 5.75
Youngstown F3, Y1 ... 5.40

RAIL STEEL BARS
Chicago Hts.(3,4)= C2 ... 4.75
Chicago Hts.(3,4)= I-2 ... 4.50
Franklin,Pa.(3,4)= F5 ... 4.75
FortWorth,Tex.(26)= T4 ... 4.85
Huntingtn,W.Va.(3)= W7 ... 5.50
Marion,O.(3)= P11 ... 4.75
Moline,Ill.(3)= R2 ... 3.80
Tonawanda,N.Y.(3)= B12 ... 4.75
Williamsport(3)= S19 ... 5.00
Williamsport(4)= S19 ... 5.10

BARS, Wrought Iron
Dover,N.J.(Staybolt)U1 ... 15.00
Dover,(Eng.Bolt) U1 ... 13.50
Dover,(Wrt.Iron) U1 ... 12.25
Economy,Pa.(S.R.) B14 ... 9.60
Economy,Pa.(D.R.)B14 ... 11.90
Economy,(Staybolt)B14 ... 12.20
McK.Rks.(Staybolt) L5 ... 14.50
McK.Rks.(S.R.) L5 ... 9.60
McK.Rks.(D.R.) L5 ... 13.00

BARS ,Reinforcing (Fabricators)
AlabamaCity,Ala. R2 ... 3.70
Alton,Ill.(6)= LI ... 3.70
Atlanta A11 ... 4.25
Buffalo R2 ... 3.70
Cleveland R2 ... 3.70
Emeryville,Calif. J7 ... 4.45
Fairfield,Ala. T2 ... 3.70
Fontana,Calif. K1 ... 4.40
Gary,Ind. U5 ... 3.70
GraniteCity,Ill. G4 ... 4.30
Ind.Harbor,Ind. I-2 Y1 ... 3.60
Irvin,Pa. U5 ... 3.60
Lackawanna,N.Y. B2 ... 3.60
Munhall,Pa. U5 ... 3.60
Niles,O. N12 ... 5.25
Pittsburg,Calif. C11 ... 4.30
Pittsburgh J5 ... 3.60
Sharon,Pa. S3 ... 4.00
So.Chicago,Ill. W14 ... 3.60
SparrowsPoint,Md. B2 ... 3.60
Steubenville,O. W10 ... 3.60
Torrance,Calif. C11 ... 4.30
Warren,O. R2 ... 3.60
Weirton,W.Va. W6 ... 3.60
WestLeechburg,Pa. A4 ... 3.75
Youngstown U5, Y1 ... 3.60

SHEETS, H.R., (19 gage)
AlabamaCity,Ala. R2 ... 4.75
Dover,N.H. ... 5.65
Ind.Harbor,Ind. I-2 ... 5.40
Mansfield,O. E6 ... 5.65
Niles,O. N12 ... 5.75
Torrance,Calif. C11 ... 5.40

SHEETS, H.R. (14-ga. heavier) High-Strength Low-Alloy
Cleveland J5, R2 ... 5.40
Conshohocken,Pa. A3 ... 5.95
Ecorse,Mich. G5 ... 5.95
Fairfield,Ala. T2 ... 5.40
Fontana,Calif. K1 ... 6.35
Gary,Ind. U5 ... 5.40
Ind.Harbor,Ind. I-2 ... 5.40
IndianaHarbor,Ind. Y1 ... 5.90
Irvin,Pa. U5 ... 5.40
Lackawanna(35), B2 ... 5.40
Pittsburgh J5 ... 5.40
Sharon,Pa. S3 ... 5.40
So.Chicago,Ill. U5 ... 5.40
SparrowsPoint(36) B2 ... 5.40
Warren,O. R2 ... 5.40
Weirton,W.Va. W6 ... 5.75
Youngstown U5 ... 5.40
Youngstown Y1 ... 5.90

SHEETS, Cold-Rolled High-Strength Low-Alloy
Cleveland J5, R2 ... 6.55
Ecorse,Mich. G5 ... 7.10
Fontana,Calif. K1 ... 7.50
Gary,Ind. U5 ... 6.55
IndianaHarbor,Ind. Y1 ... 7.05
IndianaHarbor,Ind. I-2 ... 6.55
Irvin,Pa. U5 ... 6.55
Lackawanna(37) B2 ... 6.55
Pittsburgh J5 ... 6.55
SparrowsPoint(38) B2 ... 6.55
Warren,O. R2 ... 6.55
Weirton,W.Va. W6 ... 6.90
Youngstown Y1 ... 7.05

SHEETS, Cold-Rolled Steel (Commercial Quality)

Butler,Pa. A10	4.25
Cleveland,Ju. R2	4.35
Ecorse,Mich. G4	4.35
Fairfield,Ala. T2	4.35
Follansbee,W.Va. F4	5.35
Fontana,Calif. K1	5.30
Gary,Ind. U5	4.35
Granite City,Ill. G4	5.05
Ind Harbor,Ind. I-2, Y1	4.35
Irvin,Pa. U5	4.35
Lackawanna,N.Y. B2	4.35
Middletown,O. A10	4.35
Pittsburg,Calif. C11	5.50
Pittsburgh,Pa. J5	4.35
SparrowsPoint,Md. B2	4.35
Steubenville,O. W10	4.35
Warren,O. R2	4.35
Weirton,W.Va. W6	4.35
Youngstown Y1	4.35

SHEETS, Galv'd No. 10 Steel

AlabamaCity,Ala. R2	4.80
Ashland,Ky.(8) A10	4.80
Canton,O. R2	4.80
Dover,O. R1	5.50
Fairfield,Ala. T2	4.80
Gary,Ind. U5	4.80
GraniteCity,Ill. G4	5.50
Ind Harbor,Ind. I-2	4.80
Irvin,Pa. U5	4.80
Kokomo,Ind.(13) C16	5.20
MartinsFerry,O. W10	4.80
Niles,O. N12	6.00
Pittsburg,Calif. C11	5.55
SparrowsPoint,Md. B2	4.80
Steubenville,O. W10	4.80
Torrance,Calif. C11	5.55
Weirton,W.Va. W6	4.80

SHEETS, Galvanized No. 10, High-Strength Low-Alloy

Irvin,Pa. U5	7.20
SparrowsPoint(29) B2	6.75

SHEETS, Galvannealed Steel

Canton,O. R2	5.35
Irvin,Pa. U5	5.35
Kokomo,Ind.(13) C16	5.75
Niles,O. N12	6.55

SHEETS, ZINCGRIP Steel No. 10

Butler,Pa. A10	5.05
Middletown,O. A10	5.05

SHEETS, Electro Galvanized

Cleveland R2 (28)	5.65
Niles,O. R2 (28)	5.65
Weirton,W.Va. W6	5.50

SHEETS, Zinc Alloy

Ind Harbor,Ind. I-2	5.70

SHEETS, Drum Body

Pittsburg,Calif. C11	4.30
Torrance,Calif. C11	4.30

SHEETS, Well Casing

Fontana,Calif. K1	5.10
Torrance,Calif. C11	5.10

BLUED Stock, 29 ga.

Yorkville,O. W10	6.80
Follansbee,W.Va.(23) F4	6.85

ROOFING SHORT TERNES (8 lb. Coated)

Gary,Ind. U5	9.50

MANUFACTURING TERNES (Special Coated)

Fairfield,Ala. T2	$7.60
Gary,Ind. U5	7.50
Irvin,Pa. U5	7.50
SparrowsPoint,Md. B2	7.60
Yorkville,O. W10	7.50

SHEETS, LT. Coated Ternes, 6 lb

Yorkville,O. W10	$8.40

SHEETS, Mfg. Ternes, 8 lb (Commercial Quality)

Gary,Ind. U5	$9.50
Yorkville,O. W10	9.50

SHEETS, Long Terne Steel (Commercial Quality)

Beech Bottom,W.Va. W10	5.20
Gary,Ind. U5	5.20
Mansfield,O. E6	6.05
Middletown,O. A10	5.20
Niles,O. N12	6.00
Weirton,W.Va. W6	5.20

SHEETS, Long Terne, Ingot Iron

Middletown,O. A10	5.60

SHEETS, Enameling Iron

Ashland,Ky.(8) A10	4.65
Cleveland R2	4.65
Gary,Ind. U5	4.65
GraniteCity,Ill. G4	5.35
Ind Harbor,Ind. I-2	4.65
Irvin,Pa. U5	4.65
Middletown,O. A10	4.65
Youngstown Y1	4.65

SHEETS, Culvert No. 16

	Cu Alloy	Cu Fe
Ashland,Ky. A10	5.60	
Canton,O. R2	5.65	6.10
Fairfield,Ala. T2	5.60	5.85
Gary U5	5.60	5.85
IndianaHarbor I-2	5.60	5.85
Irvin,Pa. U5	5.60	5.85
Kokomo,Ind. C16	6.25	
MartinsFy.O. W10	5.60	5.85
Pittsburg Cal. C11	6.35	
SparrowsPt. B2	5.60	
Torrance,Cal. C11	6.35	

SHEETS, Culvert, No. 16 Pure Iron

Ashland,Ky. A10	5.85
Fairfield,Ala. T2	5.85

SHEETS, Hot-Rolled Ingot Iron 18 Gage and Heavier

Ashland,Ky.(8) A10	3.85
Cleveland R2	4.20
Ind Harbor,Ind. I-2	3.85
Warren,O. R2	4.20

SHEETS, Cold-Rolled Ingot Iron

Cleveland R2	4.95
Middletown,O. A10	4.85
Warren,O. R2	4.95

SHEETS, Galvanized Ingot Iron No. 10 flat

Ashland,Ky.(8) A10	5.05
Canton,O. R2	5.55

SHEETS, ZINCGRIP Ingot Iron

Butler,Pa. A10	5.30
Middletown,O. A10	5.30

SHEETS, ALUMINIZED

Butler,Pa. A10	$.15

TIN PLATE, Electrolytic (Base Box)

	0.25-lb	0.50 lb	0.75lb
Aliquippa,Pa. J5	$7.15	$7.40	$7.80
Fairfield,Ala. T2	7.25	7.50	7.90
Gary,Ind. U5	7.15	7.40	7.80
GraniteCity,Ill. G4	7.35	7.60	8.00
Ind Harbor,Ind. I-2, Y1	7.15	7.40	7.80
Irvin,Pa. U5	7.15	7.40	7.80
Niles,O. R2	7.15	7.40	7.80
Pittsburg,Calif. C11	7.90	8.15	8.55
SparrowsPoint,Md. B2	7.25	7.50	7.90
Weirton,W.Va. W6	7.15	7.40	7.80
Yorkville,O. W10	7.15	7.40	7.80

SHEETS, SILICON, H.R. or C.R.(22 Ga.) COILS (Cut Lengths 1½c lower)

	Armature Field	Electric Motor	Dynamo
BeechBottom,W.Va.(cut-lengths)	...	7.25 8.50	9.20 ...
Brackenridge,Pa. A4 (cut-lengths)	...	7.75 9.00	9.80 ...
GraniteCity,Ill.G4 (cut-lengths)	...	7.95 9.20	... ...
Ind Harbor,Ind. I-2	6.95 7.25	(34) ...	... ...
Mansfield,O. E6 (cut-lengths)	7.10 7.25	7.75 9.00	9.80 ...
Niles,O. N12 (cut-lengths)	... 6.75	7.25 ...	... ...
Vandergrift,Pa. U5	... 7.25	7.75 9.00	9.80 ...
Warren,O. R2	6.95 7.25	7.75 9.00	9.80 ...
Zanesville,O. A10	... 7.25	7.75 9.00	9.80 ...

SHEETS, SILICON (22 Ga. Base) Coils (Cut Lengths 1½c lower)

Transformer Grade	72	65	58	52
BeechBottom,W.Va.(cut-lengths)	9.85	10.40	11.10	11.90
Brackenridge,Pa. A4	10.35	...	...	...
Vandergrift,Pa. U5	10.35	10.90	11.60	12.40
Warren,O. R2	10.35	...	...	...
Zanesville,O. A10	10.35	10.90	11.60	12.40

H.R. or C.R. COILS AND CUT LENGTHS, SILICON (22 Ga.)

	T-100	T-90	T-80	T-73
Butler,Pa. A10 (C.R.)	...	...	14.75	15.25
Vandergrift,Pa. U5	12.90	13.75	14.75	15.25

TIN PLATE, American Cokе (Base Box)

	1.25 lb	1.50 lb
Aliquippa,Pa. J5	$8.45	$8.70
Fairfield,Ala. T2	8.55	8.80
Gary,Ind. U5	8.45	8.70
Ind.Har. I-2, Y1	8.45	8.70
Irvin,Pa. U5	8.45	8.70
Pitts.Calif. C11	9.20	9.45
Sp.Pt.,Md. B2	8.55	8.80
Warren,O. R2	8.45	8.70
Weirton,W.Va. W6	8.45	8.70
Yorkville,O. W10	8.45	8.70

BLACK PLATE (Base Box)

Aliquippa,Pa. J5	$6.25
Fairfield,Ala. T2	6.35
Gary,Ind. U5	6.25
GraniteCity,Ill. G4	6.45
Ind.Harbor,Ind. I-2, Y1	6.25
Irvin,Pa. U5	6.25
Niles,O. R2	6.25
Pittsburg,Calif. C11	7.00
SparrowsPoint,Md. B2	6.35
Warren,O. R2	6.25
Weirton,W.Va. W6	6.25
Yorkville,O. W10	6.25

HOLLOWARE ENAMELING Black Plate (29 gage)

Follansbee,W.Va. F4	5.85
Gary,Ind. U5	5.85
GraniteCity,Ill. G4	6.05
Ind.Harbor,Ind. Y1	5.30
Irvin,Pa. U5	5.85
Yorkville,O. W10	6.15

STRIP, Hot-Rolled Alloy

Bridgprt.Conn.(10) S15	5.45
Carnegie,Pa. S18	5.85
Fontana,Calif. K1	6.70
Gary,Ind. U5	5.50
Houston,Tex. S5	5.90
KansasCity,Mo. S5	6.10
Midland,Pa. C18	5.85
NewBrit.Conn.(10) S15	5.45
Sharon,Pa. S8	5.85
Youngstown U5	5.50

STRIP, Hot-Rolled, High-Strength Low-Alloy

Bessemer,Ala. T2	5.30
Conshohocken,Pa. A3	5.55
Ecorse,Mich. G5	5.95
Fairfield,Ala. T2	5.30
Fontana,Calif. K1	6.20
Gary,Ind. U5	5.30
Ind Harb.,Ind. I-2	5.30
IndianaHarbor,Ind. Y1	5.80
Lackawanna,N.Y. B2	4.95
LosAngeles(25) B3	6.05
Seattle B3	6.30
Sharon,Pa. S3	5.40
So.SanFrancisco(25) B3	6.05
SparrowsPoint,Md. B2	4.95
Warren,O. R2	5.30
Weirton,W.Va. W6	5.75
Youngstown U5	5.80
Youngstown Y1	5.30

STRIP, Cold-Rolled, High-Strength Low-Alloy

Cleveland J5	6.70
Cleveland A7	6.55
Dover,O. G6	7.30
Fontana,Calif. K1	6.95
Lackawanna,N.Y. B2	6.40
Sharon,Pa. S3	6.55
SparrowsPoint,Md. B2	6.40
Warren,O. R2	6.55
Weirton,W.Va. W6	7.20
Youngstown Y1	7.95

STRIP, Hot-Rolled Carbon

Ala.City,Ala.(27) R2	3.50
Alton,Ill.(1) L1	3.75
Ashland,Ky.(8) A10	3.50
Atlanta A11	4.05
Bessemer,Ala. T2	3.50
Bridgeprt.Conn.(10) S15	4.00
Buffalo(27) R2	3.50
Butler,Pa. A10	3.50
Carnegie,Pa. S18	4.00
Conshohocken,Pa. A3	3.90
Detroit M1	4.40
Ecorse,Mich. G5	3.80
Fairfield,Ala. T2	3.50
Fontana,Calif. K1	4.75
Gary,Ind. U5	3.50
Houston,Tex. S5	4.00
Ind.Harbor,Ind. I-2, Y1	3.50
Johnstown,Pa.(25) B2	3.50
KansasCity,Mo.(9) S5	4.10
Lackawanna,N.Y.(32) B2	3.50
LosAngeles B3	4.25
Milton,Pa. B6	4.00
Minnequa,Colo. C10	4.55
NewBritain(10) S15	4.00
No.Tonawanda,N.Y. B11	3.50
Pittsburg,Calif. C11	4.25
Riverdale,Ill. A1	3.50
SanFrancisco S7	4.85
Seattle B3, N14	4.00
Sharon,Pa. S3	4.00
So.Chicago,Ill. W14	3.50
So.SanFrancisco B3	4.25
SparrowsPoint,Md. B2	3.50
Torrance,Calif. C11	4.25
Warren,O. R2	3.50
Weirton,W.Va. W6	3.90
WestLeechburg,Pa. A4	3.75
Youngstown U5, Y1	3.50

STRIP, Cold-Rolled Alloy Steel

Bridgeprt.Conn.(10) S15	10.75
Carnegie,Pa. S18	10.60
Cleveland A7	10.00
Dover,O. G6	10.50
Fontana,Calif. K1	11.65
Harrison,N.J. C18	10.60
Midland,Pa. C18	10.60
NewBritn.Conn.(10) S15	10.75
Pawtucket,R.I.(11) NS	10.75
Pawtucket,R.I.(12) NS	11.05
Sharon,Pa. S3	10.60
Worcester,Mass. A7	10.30
Youngstown C8	10.60

STRIP, Cold-Rolled Carbon

Anderson,Ind.(40) G6	5.50
Berea,O. C7	6.60
Bridgprt.Conn.(10) S15	5.35
Butler,Pa. A10	4.65
Cleveland A7, J5	4.65
Dearborn,Mich. I3	5.60
Detroit D2	5.60
Detroit M1	5.45
Dover,O.(40) G6	5.50
Ecorse,Mich. G5	4.85
Follansbee,W.Va. F4	5.35
Fontana,Calif. K1	6.30
FranklinPark,Ill.(40) T6	4.90
Ind.Harbor,Ind. I-2	4.90
Lackawanna,N.Y. B2	4.65
LosAngeles C1	6.10
Mattapan,Mass. T6	5.50
Middletown,O. A10	4.65
NewBritain(10) S15	5.35
NewCastle,Pa. B4	5.35
NewCastle(40) E5	5.25
NewHaven,Conn. I2	5.85
NewHaven,Conn. A7	6.15
Pawtucket,R.I. R3	6.00
Pawtucket,R.I.(21) NS	5.85
Riverdale,Ill.(40) A1	4.90
Rome,N.Y. R6	5.40
Sharon,Pa. S3	5.35
SparrowsPoint,Md. B2	4.65
Trenton,N.J. R5	6.00
Wallingford,Conn. W2	5.85
Warren,O.(40) T5	5.25
Warren,O. R2	4.65
Weirton,W.Va. W6	4.65
Youngstown C8 (40)	5.25
Youngstown Y1	4.65

STRIP, Electro Galvanized

Dover,O. G6	5.50
Fontana,Calif. K1	5.25
Warren,O. R2	4.65
Weirton,W.Va. W6	4.65
Youngstown C8	5.25

STRIP, Cold-Finished Spring Steel (Annealed)

	0.26-0.40C	0.41-0.60C	0.61-0.80C	0.81-1.05C	1.06-1.35C
Berea,O. C7		6.80	7.40	9.35	11.65
Bridgeport,Conn.(10) S15	5.35	6.80	7.40	9.35	11.65
Bristol,Conn. W1			7.70	9.65	
Carnegie,Pa. S18		6.80	7.40	9.35	11.65
Cleveland A7	4.65	6.45	7.10	9.35	11.65
Dearborn,Mich. I3	5.60	7.05	7.65		
Detroit D2	5.60	6.65	7.25		
Dover,O. G6	5.50	6.80	7.40	9.35	11.65
FranklinPark,Ill. T6	5.00	6.60	7.55	9.50	11.80
Harrison,N.J. C18			7.70	9.65	11.95
Mattapan,Mass. T6	5.50	6.75	7.70	9.65	11.95
NewBritn.Conn.(10) S15	5.35	6.80	7.40	9.35	11.65
NewCastle,Pa. B4	5.35	6.80	7.40	9.35	
NewCastle,Pa. E5	5.50	6.80	7.40	9.35	11.65
NewHaven,Conn. D2	5.85	6.75	7.35		
NewYork W3		7.10	7.70	9.65	11.95
Pawtucket,R.I. NS:					
Cleve.or Pitts.Base		6.80	7.40	9.35	11.65
Worcester,Mass.Base	5.85	7.10	7.70	9.65	11.95
Sharon,Pa. S3	5.35	6.80	7.40	9.35	11.65
Trenton,N.J. R5		7.10	7.70	9.65	11.95
Wallingford,Conn. W2	5.85	6.75	7.35	9.30	11.60
Weirton,W.Va. W6	5.35	6.80	7.40	9.35	11.65
Worcester,Mass. A7	4.95	6.75	7.70	9.65	11.95
Worcester,Mass. T6	5.50	6.75	7.70	9.65	11.95
Youngstown C8		6.80	7.40	9.35	11.65

Spring Steel (Tempered)

Trenton,N.J. R5		10.30	12.50	15.35
Harrison,N.J. C18		10.30	12.50	15.35
NewYork W3		10.30	12.50	15.35

Key to Producers

A1 Acme Steel Co.
A3 Alan Wood Steel Co.
A4 Allegheny Ludlum Steel
A7 American Steel & Wire
A8 Anchor Drawn Steel Co.
A9 Angell Nail & Chaplet
A10 Armco Steel Corp.
A11 Atlantic Steel Co.
A13 American Cladmetals Co.

B1 Babcock & Wilcox Tube
B2 Bethlehem Steel Co.
B3 Beth. Pac. Coast Steel
B4 Blair Strip Steel Co.
B5 Bliss & Laughlin Inc.
B6 Bourdon Steel Corp.
B8 Braeburn Alloy Steel
B11 Buffalo Bolt Co.
B12 Buffalo Steel Co.
B14 A. M. Byers Co.

C1 Calstrip Steel Corp.
C2 Calumet Steel Div. Borg-Warner Corp.
C4 Carpenter Steel Co.
C5 Central Iron & Steel Div.
Barium Steel Corp.
C7 Cleve. Cold Rolling Mills
C8 Cold Metal Products Co.
C9 Colonial Steel Co.
C10 Colorado Fuel & Iron
C11 Columbia Steel Co.
C12 Columbia Steel & Shaft
C13 Columbia Tool Steel Co.
C14 Compressed Steel Shaft
C16 Continental Steel Corp.
C17 Copperweld Steel Co.
C18 Crucible Steel Co.
C19 Cumberland Steel Co.
C20 Cuyahoga Steel & Wire
C22 Claymont Steel Corp.

D2 Detroit Steel Corp.
D3 Detroit Tube & Steel
D4 Disston & Sons, Henry
D6 Driver Harris Co.
D7 Dickson Weatherproof Nail Co.

E1 Eastern Gas&Fuel Assoc.
E2 Eastern Stainless Steel
E4 Electro Metallurgical Co.
E5 Elliott Bros. Steel Co.
E6 Empire Steel Corp.

F2 Firth Sterling Steel
F3 Fitzsimons Steel Co.
F4 Follansbee Steel Corp.
F5 Franklin Steel Div. Borg-Warner Corp.
F6 Fretz-Moon Tube Co.
F7 Ft. Howard Steel & Wire

G1 Geneva Steel Co.
G2 Globe Iron Co.
G3 Globe Steel Tubes Co.
G4 Granite City Steel Co.
G5 Great Lakes Steel Corp.
G6 Greer Steel Co.

H1 Hanna Furnace Corp.

I-1 Igoe Bros. Inc.
I-2 Inland Steel Co.
I-3 Interlake Iron Corp.
I-4 Ingersoll Steel Div., Borg-Warner Corp.

J1 Jackson Iron & Steel Co.
J3 Jessop Steel Co.
J4 Johnson Steel & Wire Co.
J5 Jones & Laughlin Steel
J6 Jordan Mfg. & Supply
J7 Judson Steel Corp.
J8 Jersey Shore Steel Co.

K1 Kaiser Steel Corp.
K2 Keokuk Electro Metals
K3 Keystone Drawn Steel
K4 Keystone Steel & Wire

L1 Laclede Steel Co.
L2 LaSalle Steel Co.
L3 Latrobe Electric Steel
L5 Lockhart Iron & Steel
L6 Lone Star Steel Co.
L7 Lukens Steel Co.

STRIP, Hot-Rolled Ingot Iron

Ashland,Ky. (8) A10 ... 3.75
Warren,O. R2 ... 4.10

STRIP, Cold-Rolled Ingot Iron

Warren,O. R2 ... 5.25

TIGHT COOPERAGE HOOP

Atlanta A11 ... 4.05
Riverdale,Ill. A5 ... 3.90
Sharon, Pa. S3 ... 4.15
Youngstown O3 ... 3.75

WIRE, Merchant Quality

	(6 to 8 gage)	An'ld	Galv.
Alabama City	R2	5.70	6.95
Aliquippa	J5	5.70	6.65
Atlanta	A11	5.70	6.65
Bartonville(19)	K4	5.70	6.65
Buffalo	W12	4.85	...
Cleveland	A7	5.70	6.15
Crawfordsville	M8	5.95	6.40
Donora,Pa.	A7	5.70	6.15
Duluth,Minn.	A7	5.70	6.15
Fairfield	T2	5.70	6.15
Houston, Tex.	S5	6.10	6.55
Johnstown	B2	5.70	6.15
Joliet, Ill.	A7	5.70	6.15
KansasCy.,Mo.	S5	6.30	6.75
Kokomo	C16	5.80	6.00
LosAngeles	B3	6.65	...
Minnequa	C10	5.95	6.40
Monessen	P7	5.95	6.40
Palmer	W12	5.75	...
Pitts.Calif.	C11	6.65	6.80
Prtsmth.(18)	P12	6.10	6.60
Rankin	A7	5.70	6.15
So.Chicago	R2	5.70	5.95
So.S.Fran.	C10	6.65	7.10
SparrowsPt.	B2	5.70	6.25
Sterling,Ill.(11)	N15	5.70	6.15
Struthers,O.	Y1	5.70	6.15
Torrance,Cal.	C11	6.65	...
Worcester	A7	6.00	6.45

	An'ld	Galv.
WIRE (16 gage)	**Stone**	**Stone**
Aliquippa J5	10.15	12.15
Bartonville(19) K4	10.25	11.95
Cleveland A7	10.25	12.15
Crawfrdsville M8	10.30	12.00
Fostoria,O. S1	10.40	13.00
Johnstown B2	10.25	12.15
Kokomo C16	10.25	11.80
Minnequa C10	10.40	12.40
Palmer,Mass. C12	10.25	12.15
Pitts.Cal. C11	10.60	12.50
Prtsmth.(18) P12	10.55	12.30
SparrowsPt. B2	10.35	12.25
Waukegan A7	10.25	12.15

ROPE WIRE (A) (B)

Bartonville,Ill. K4 8.55 8.80
Buffalo W12 ... 8.55 8.80
Fostoria,O. S1 ... 8.55 9.00
Johnstown, Pa. B2 8.55 8.80
Monessen,Pa. P16 8.55 8.80
Monessen,Pa. P7 ... 8.80 9.05
Palmer,Mass. W12 ... 8.55 9.10
Portsmouth,O. P12 8.55 8.80
Roebling,N.J. R5 ... 8.55 9.40
SparrowsPt. B2 ... 8.65 8.90
Struthers,O. Y1 ... 8.55 8.80
Worcester J4, T6 8.85 9.10

(A) Plow and Mild Plow.
(B) Improved Plow.

WIRE, Manufacturers Bright, Low Carbon

AlabamaCity,Ala. R2 ... 4.85
Aliquippa,Pa. J5 ... 4.85
Atlanta A11 ... 5.10
Alton,Ill.(1) L1 ... 4.85
Bartonville,Ill.(1) K4 ... 4.85
Buffalo W12 ... 4.85
Chicago W13 ... 5.10
Cleveland A7, C20 ... 4.85
Crawfordsville,Ind. M8 ... 5.10
Donora,Pa. A7 ... 4.85
Duluth,Minn. A7 ... 4.85
Fostoria,O. S1 ... 4.85
Houston,Tex. S5 ... 5.10
Johnstown,Pa. B2 ... 4.85
Joliet, Ill. A7 ... 4.85
Kansas City,Mo. S5 ... 4.85
Kokomo,Ind. C16 ... 4.85
Palmer, Mass. W12 ... 4.85
Pittsburg,Calif. C11 ... 5.80
Portsmouth,O. P12 ... 5.20
Rankin,Pa. A7 ... 4.85
So.Chicago,Ill. R2 ... 4.85
So.SanFrancisco C10 ... 5.80
SparrowsPoint,Md. B2 ... 4.95
Sterling,Ill.(1) N15 ... 4.85
Struthers,O. Y1 ... 4.85
Torrance,Calif. C11 ... 5.80
Waukegan,Ill. A7 ... 4.85
Worcester,Mass. A7, T6 ... 4.15

WIRE, Cold-Rolled Flat

Anderson,Ind. G6 ... 6.20
Buffalo W12 ... 5.85
Cleveland A7 ... 5.95
Crawfordsville,Ind. M8 ... 6.20
Detroit D2 ... 6.20
Dover,O. G6 ... 6.20
Fostoria,O. S1 ... 6.00
Kokomo,Ind. C16 ... 5.70
Franklin Park,Ill. T6 ... 6.20
Massillon,O. R8 ... 5.85
Monessen,Pa. P16 ... 5.85
Monessen,Pa. P7 ... 6.10
NewHaven,Conn. D2 ... 6.50
Pawtucket,R.I.(12) NS ... 6.85
Trenton,N.J. R5 ... 6.15
Worcester A7 ... 6.15
Worcester T6 ... 6.50
Worcester W12 ... 6.65

WIRE, Fine & Weaving(8 Coils)

Bartonville,Ill.(1) K4 ... 8.90
Buffalo W12 ... 8.90
Chicago W13 ... 8.90
Cleveland A7 ... 8.90
Crawfordsville, Ind. M8 ... 8.95
Fostoria,O. S1 ... 8.90
Johnstown,Pa. B2 ... 8.90
Kokomo,Ind. C16 ... 8.90
Monessen,Pa. P16 ... 8.90
Palmer,Mass. W12 ... 9.20
Portsmouth,O. P12 ... 8.90
Roebling,N.J. R5 ... 9.20
Waukegan,Ill. A7 ... 8.90
Worcester,Mass. A7, T6 9.20

WIRE, Galv'd ACSR for Cores

Bartonville,Ill. K4 ... 8.50
Monessen,Pa. P16 ... 8.50
Roebling,N.J. R5 ... 8.80
SparrowsPoint,Md. B2 ... 8.60
Johnstown,Pa. B2 ... 8.50

WIRE, Tire Bead

Bartonville,Ill.(1) K4 ... 10.90
Monessen,Pa. P16 ... 11.40
Roebling,N.J. R5 ... 11.55

WIRE, MB Spring, High Carbon

Aliquippa,Pa. J5 ... 6.25
Alton,Ill.(1) L1 ... 6.25
Bartonville,Ill.(1) K4 ... 6.25
Buffalo W12 ... 6.25
Cleveland A7 ... 6.25
Donora,Pa. A7 ... 6.25
Duluth, A7 ... 6.25
Fostoria,O. S1 ... 6.25
Johnstown,Pa. B2 ... 6.25
Los Angeles B3 ... 7.20
Millbury,Mass.(12) N6 ... 8.05
Monessen,Pa. P7, P16 ... 6.25
Palmer,Mass. W12 ... 6.55
Pittsburg,Calif. C11 ... 7.20
Roebling,N.J. R5 ... 6.55
Portsmouth,O. P12 ... 6.25
So. Chicago,Ill. R2 ... 6.25
So.SanFrancisco C10 ... 7.20
SparrowsPoint,Md. B2 ... 6.35
Struthers,O. Y1 ... 6.25
Trenton,N.J. A7 ... 6.55
Waukegan,Ill. A7 ... 6.25
Worcester,Mass. J4 ... 6.75

WIRE, Upholstery Spring

Aliquippa,Pa. J5 ... 5.90
Alton,Ill.(1) L1 ... 5.90
Buffalo W12 ... 5.90
Cleveland A7 ... 5.90
Donora,Pa. A7 ... 5.90
Duluth,Minn. A7 ... 5.90
Johnstown,Pa. B2 ... 5.90
Los Angeles B3 ... 8.55
Monessen,Pa. P7, P16 ... 5.90
NewHaven,Conn. A7 ... 6.20
Palmer,Mass. W12 ... 6.20
Pittsburg,Calif. C11 ... 9.85
Portsmouth,O. P12 ... 5.90
Roebling,N.J. R5 ... 6.20
So.Chicago,Ill. R2 ... 5.90
So.SanFrancisco C10 ... 8.85
SparrowsPoint,Md. B2 ... 6.00
Torrance,Calif. C11 ... 6.85
Trenton, N.J. A7 ... 6.20
Waukegan,Ill. A7 ... 5.90
Worcester,Mass. A7 ... 6.20

WOVEN FENCE, 9-15½ Ga. **Col.**

AlabamaCity,Ala. R2 ... 126
Ala.City,Ala.,17-19ga. R2 ... 217
Aliquippa,Pa.9-14½ga. J5 ... 130
Alton,Ill. L1 ... 133
Bartonville,Ill.(19) K4 ... 130
Crawfordsville,Ind. M8 ... 132
Donora,Pa. A7 ... 130
Duluth,Minn. A7 ... 130
Fairfield,Ala. T2 ... 130
Houston,Tex. S5 ... 138
Johnstown,Pa. B2 ... 130
Johnstown,17ga. 6" B2 ... 204
Johnstown,17ga. 4" B2 ... 267
Joliet, Ill. A7 ... 130
KansasCity,Mo. S5 ... 142
Kokomo,Ind. C16 ... 132
Minnequa,Colo. C10 ... 138
Monessen,Pa. P7 ... 135
Pittsburg,Calif. C11 ... 153
Portsmouth,O.(18) P12 ... 137
Rankin,Pa. A7 ... 130
So.Chicago,Ill. R2 ... 126
Sterling,Ill.(1) N15 ... 130

FENCE POSTS

Chicagoflts.,Ill. C2 ... 140
Duluth, Minn. A7 ... 125
Franklin,Pa. F5 ... 140
Huntington,W.Va. W7 ... 140
Johnstown,Pa. B2 ... 140
Marion,O. M11 ... 140
Minnequa,Colo. C10 ... 130
Moline,Ill. R2 ... 126
So.Chicago R2 ... 140
Tonawanda,N.Y. B12 ... 140
Williamsport,Pa. S19 ... 150

WIRE, Barbed **Col.**

AlabamaCity,Ala. R2 ... 136
Aliquippa,Pa. J5 ... 140
Atlanta A11 ... 143
Bartonville,Ill.(19) K4 ... 143
Crawfordsville,Ind. M8 ... 145
Donora,Pa. A7 ... 140
Duluth,Minn. A7 ... 140
Fairfield,Ala. T2 ... 140
Houston,Tex. S5 ... 148
Johnstown,Pa. B2 ... 140
Joliet,Ill. A7 ... 140
KansasCity,Mo. S5 ... 152
Kokomo,Ind. C16 ... 142
Minnequa,Colo. C10 ... 146
Monessen,Pa. P7 ... 145
Pittsburg,Calif. C11 ... 166
Portsmouth,O.(18) P12 ... 147
Rankin,Pa. A7 ... 140
So.Chicago,Ill. R2 ... 136
So.SanFran.,Calif. C10 ... 160
SparrowsPoint,Md. B2 ... 142
Sterling,Ill.(1) N15 ... 140

BALE TIES, Single Loop **Col.**

AlabamaCity,Ala. R2 ... 123
Atlanta A11 ... 126
Bartonville,Ill.(19) K4 ... 123
Crawfordsville,Ind. M8 ... 132
Donora,Pa. A7 ... 123
Duluth,Minn. A7 ... 123
Fairfield,Ala. T2 ... 123
Joliet,Ill. A7 ... 123
KansasCity,Mo. S5 ... 135
Kokomo,Ind. C16 ... 125
Minnequa,Colo. C10 ... 128
Pittsburg,Calif. C11 ... 147
So.Chicago,Ill. R2 ... 123
So.SanFran.,Calif. C10 ... 147
SparrowsPoint,Md. B2 ... 125
Sterling,Ill.(1) N15 ... 123

NAILS & STAPLES, Non-Stock

AlabamaCity,Ala. R2 ... 6.10
Bartonville,Ill.(19) K4 ... 5.95
Crawfordsville,Ind. M8 ... 6.30
Donora,Pa. A7 ... 5.95
Duluth,Minn. A7 ... 5.95
Johnstown,Pa. B2 ... 5.95
Joliet,Ill. A7 ... 5.95
Kokomo,Ind. C16 ... 6.05
Minnequa,Colo. C10 ... 6.20
Pittsburg,Calif. C11 ... 6.90
Portsmouth,O. P12 ... 6.25
Rankin,Pa. A7 ... 5.95
So. Chicago,Ill. R2 ... 6.10
SparrowsPoint,Md. B2 ... 6.05
Sterling,Ill.(1) N15 ... 5.65
Worcester,Mass. A7 ... 6.25

NAILS, Cut (100 lb keg)

To dealers (33)

Conshohocken,Pa. A3 ... $7.35
Wheeling,W.Va. W10 ... 7.35

RAILS	Std. No. 1	Std. No. 2	Std. All No. 2	Tee Rails 60 lb Under
Bessemer Pa. U5	3.60	3.50	3.55	4.00
Ensley,Ala. T2	3.60	3.50	...	4.00
Fairfield,Ala. T2	...	...	...	4.00
Gary,Ind. U5	3.60	3.50	3.55	...
Huntington,W.Va. W7	...	...	...	5.00
Ind.Harbor,Ind. I-2	3.60	3.50	3.55	...
Johnstown,Pa. B2	...	...	...	(16)4.00
Lackawanna B2	3.60	3.50	...	4.00
Minnequa,Colo. C10	3.60	3.50	...	4.50
Steelton,Pa. B2	3.60	3.50	...	...
Williamsport,Pa. S19	...	...	...	4.75

NAILS & STAPLES, Stock

To dealers & mfrs. (1)	Col.
AlabamaCity,Ala. R2	118
Aliquippa,Pa. (13) J5	118
Atlanta A11	123
Bartonville,Ill.(19) K4	118
Chicago,Ill. W13	118
Cleveland A9	125
Crawfordsville,Ind. M2	122
Donora,Pa. A7	118
Duluth,Minn. A7	118
Fairfield,Ala. T2	118
Galveston,Tex. D7	126
Houston,Tex. S5	126
Johnstown,Pa. B2	118
Joliet,Ill. A7	118
KansasCity,Mo. S5	130
Kokomo,Ind. C16	120
Minnequa,Colo. C10	123
Monessen,Pa. P7	124
Pittsburg,Calif. C11	137
Portsmouth,O. P12	124
Rankin,Pa. A7	118
So.Chicago,Ill. R2	118
SparrowsPoint,Md. B2	120
Sterling,Ill.(1) N15	118
Torrance,Calif. C11	138
Worcester,Mass. A7	124

STANDARD TRACK SPIKES

Ind.Harbor,Ind. I-2, Y1 ... 6.15
KansasCity,Mo. S5 ... 6.40
Lebanon,Pa. B2 ... 6.15
Minnequa,Colo. C10 ... 6.15
Pittsburgh J5 ... 6.15
Seattle B3 ... 6.65
So.Chicago,Ill. R2 ... 6.15
Struthers,O. Y1 ... 6.15
Youngstown R2 ... 6.15

TRACK BOLTS (20) Treated

KansasCity,Mo. S5 ... 9.85
Lebanon,Pa.(32) B2 ... 9.85
Minnequa,Colo. C10 ... 9.85
Pittsburgh O3, P14 ... 9.85
Seattle B3 ... 10.25

TIE PLATES

Fairfield,Ala. T2 ... 4.50
Gary,Ind. U5 ... 4.50
Ind.Harbor,Ind. I-2 ... 4.50
Lackawanna,N.Y. B2 ... 4.50
Minnequa,Colo. C10 ... 4.50
Pittsburg,Calif. C11 ... 4.65
Seattle B3 ... 4.65
Steelton,Pa. B2 ... 4.50
Torrance,Calif. C11 ... 4.65

JOINT BARS

Bessemer, Pa. U5 ... 4.70
Fairfield,Ala. T2 ... 4.70
Ind.Harbor,Ind. I-2 ... 4.70
Joliet,Ill. U5 ... 4.70
Lackawanna,N.Y. B2 ... 4.70
Minnequa,Colo. C10 ... 4.70
Steelton,Pa. B2 ... 4.70

AXLES

Ind.Harbor,Ind. S18 ... 5.60
Johnstown,Pa. B2 ... 5.60

Key to Producers

M1 McLouth Steel Corp.
M4 Mahoning Valley Steel
M5 Medart Co.
M6 Mercer Tube & Mfg. Co.
M8 Mid-States Steel & Wire
M9 Midvale Co.
M12 Moltrup Steel Products
M13 Monarch Steel Co.
M14 McInnes Steel Co.

N2 National Supply Co.
N3 National Tube Co.
N5 Nelsen Steel & Wire Co.
N6 NewEng.HighCarb.,Wire
N8 Newman-Crosby Steel
N12 Niles Rolling Mill Co.
N14 Northwst. Steel Roll. Mills
N15 Northwestern S.&W. Co.
N16 New Delphos Mfg. Co.

O3 Oliver Iron & Steel Corp.
O4 Oregon Steel Mills

P1 Pacific States Steel Corp.
P2 Pacific Tube Co.
P4 Phoenix Iron & Steel Co.
P5 Pilgrim Drawn Steel
P6 Pittsburgh Coke & Chem.
P7 Pittsburgh Steel Co.
P9 Pittsburgh Tube Co.
P11 Pollak Steel Co.
P12 Portsmouth Division, Detroit Steel Corp.
P13 Precision Drawn Steel
P14 Pitts. Screw & Bolt Co.
P15 Pittsburgh Metallurgical
P16 Page Steel & Wire Div., Amer. Chain & Cable
P17 Plymouth Steel Co.

R1 Reeves Steel & Mfg. Co.
R2 Republic Steel Corp.
R3 Rhode Island Steel Corp.
R5 Roebling's Sons, John A.
R6 Rome Strip Steel Co.
R7 Rotary Electric Steel Co.
R8 RelianceDiv.,EatonMfg.

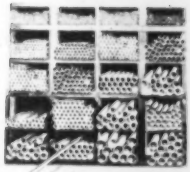
S1 Seneca Wire & Mfg. Co.
S3 Sharon Steel Corp.
S5 Sheffield Steel Corp.
S6 Shenango Furnace Co.
S7 Simmons Co.
S8 Simonds Saw & Steel Co.
S9 Sloss-Sheffield, S.&I. Co.
S13 Standard Forgings Corp.
S14 Standard Tube Co.
S15 Stanley Works
S16 Struthers Iron & Steel
S17 Superior Drawn Steel Co.
S18 Superior Steel Corp.
S19 Sweet's Steel Co.
S20 Southern States Steel
T2 Tenn. Coal, Iron & R.R.
T3 Tenn. Prod. & Chem.
T4 Texas Steel Co.
T5 Thomas Steel Co.
T6 Thompson Wire Co.
T7 Timken Roller Bearing
T9 Tonawanda Iron Div. Am. Rad. & Stan. San.
U1 Ulster Iron Works
U4 Universal Cyclops Steel
U5 United States Steel Co.
V2 Vanadium-Alloys Steel
V3 Vulcan Crucible Steel Co.
W1 Wallace Barnes Co.
W2 Wallingford Steel Co.
W3 Washburn Wire Co.
W4 Wilbur-Driver Steel Corp.
W6 Weirton Steel Co.
W7 W. Va. Steel & Mfg. Co.
W8 West Auto.Mach.Screw
W9 Wheatland Tube Co.
W10 Wheeling Steel Corp.
W12 Wickwire Spencer Steel Div., Colo. Fuel & Iron
W13 Wilson Steel & Wire Co.
W14 Wisconsin Steel Div., International Harvester
W15 Woodward Iron Co.
W18 Wyckoff Steel Co.
Y1 Youngstown Sheet & Tube

TOOL STEEL

Grade	Cents per lb	Grade	Cents per lb
Reg. Carbon	23.00	13.5W.4Cr. 3V	160.25
Extra Carbon	27.00	18W.4Cr.2V.9Co	246.50
Spec. Carbon	29.50	18W.4Cr.2V.7Co	246.00
Oil Hardening	35.00	18.25W.4.25Cr.1V.4.75Co	213.00
Cr. Hot Work	40.00	20.25W.4.25Cr.1.6V.12.25Co	353.50
Hi-Carbon-Cr	63.50	1.5W.4Cr.1V.8.5Mo	80.75
18W.4Cr.1V	151.00	6.4W.4.5Cr.1.9V.5Mo	97.50
18W.4Cr.2V	165.00	6W.4Cr.3V.6Mo	118.50

Tool steel producers include: A4, A8, B2, B8, C4, C9, C13, C18, D4, F2, J3, L3, M14, S8, U4, V2, V3.

(1) Chicago base.
(2) Angles, flats, bands.
(3) Merchant bars; Reinforcing.
(5) Philadelphia del.
(6) Chicago or Birm. base.
(7) To jobbers, 3 cols. lower.
(8) 16 gage and heavier.
(9) 6 in. and narrower.
(10) Pittsburgh base.
(11) Cleveland & Pittsburgh base.
(12) Worcester, Mass. base.
(13) Add 0.50c for 17 Ga & heavier.
(14) Also wide flange beams.
(15) ¾" and thinner.
(16) 40 lb and under.
(17) Flats only.
(18) To dealers.
(19) Chicago & Pittsburgh base.
(20) Deduct 0.25c for untreated.
(21) New Haven,Conn. base.
(22) Incl. San Fran. Bay area.
(23) 28 Ga. 36" wide.
(24) Deduct 0.25c, fine than 15 Ga.
(25) Bar mill bands.
(26) Merchant, mill lengths, to fabricators; to consumers, 5.60c.
(27) Bar mill sizes.
(28) Rerolled.
(29) Subject to 10% increase.
(30) Sheared; add 0.55c for universal mill.
(31) Not annealed.
(32) Rd. edge or square edge.
(33) To jobbers, deduct 20 cents.
(34) 7.25c for cut lengths.
(35) 12" and narrower.
(36) 24" and narrower.
(37) 15 gage & lighter; 60" & narrower.
(38) 14 gage & lighter; 48" & narrower.
(39) 48" and narrower.
(40) Lighter than 0.035"; 0.035" and heavier, 0.25c higher.



You Can Help S-T-R-E-T-C-H

the supply of stainless pipe by specifying Schedule 5

Sure, Stainless Pipe is tough to get these days. But by specifying LIGHT WEIGHT *Schedule 5* you can help the mills almost double the supply

Here is the answer

Wherever you buy your Stainless Pipe, get all the facts about the strength and other technical advantages of LIGHT WALL *Schedule 5* pipe. It weighs half as much as Schedule 40 pipe. It costs half as much. And it uses half the nickel and chrome because of its LIGHT WALLS. Yet, with all that, *Schedule 5* Stainless Pipe is plenty strong enough to give you complete safety for working pressures up to 150 psi. In sizes under 1½", working pressures can be considerably higher.

Before planning your next job "the same old way" with Schedule 40 pipe, talk to your steel distributor or producer. Consider taking full advantage of the strength of Stainless, by using LIGHT WEIGHT *Schedule 5* Stainless Pipe.

And here's your chance—Call your Carpenter Stainless Tubing Distributor or write to us for this set of Data Sheets on *Schedule 5* Stainless Pipe. They show *why* and *how Schedule 5* offers all industry more Stainless Pipe for essential uses.

THE CARPENTER STEEL COMPANY
Alloy Tube Division, Union, N. J.
Export Department: Carpenter Steel Co., Reading, Pa. — "CARSTEELCO"

Carpenter

STAINLESS TUBING & PIPE · Analysis · · Tolerance · · Finish · - guaranteed on every shipment

STEEL

STANDARD PIPE, T. & C.

BUTTWELD Size Inches	List Per Ft	Pounds Per Ft	Carload Discounts from List, % Black A	Black B	Black C	Galvanized D	Galvanized E	Galvanized F
⅛	5.5c	0.24	34.0	32.0	29.0	1.5	+0.5	+3.5
¼	6.0	0.42	28.5	26.5	23.5	+1.0	+3.0	+6.0
⅜	6.0	0.57	23.5	21.5	18.5	+7.0	+9.0	+12.0
½	8.5	0.85	36.0	34.0	35.0	14.0	12.0	13.0
¾	11.5	1.18	39.0	37.0	38.0	18.0	16.0	17.0
1	17.0	1.68	41.5	39.5	40.5	21.5	19.5	20.5
1¼	23.0	2.28	42.0	44.0	41.0	22.0	24.0	21.0
1½	27.5	2.78	42.5	41.5	41.5	23.0	21.5	22.0
2	37	3.68	43.0	41.0	42.0	23.5	21.5	22.5
2½	58.5	5.82	43.5	41.5	42.5	24.0	22.0	23.0
3	76.5	7.62	43.5	41.5	42.5	24.0	22.0	23.0

Column A: Etna, Pa. N2; Butler, Pa. ⅛-⅜", F6; Benwood, W. Va., 3½ points lower on ⅛", 1½ points lower on ¼", and 2 points lower on ⅜", W10; Sharon, Pa. M6, 1 point higher on ⅛", 2 points lower on ¼" and ⅜". Following make ½" and larger: Lorain, O., N3; Youngstown R2 and 36¼% on 3½" and 4"; Youngstown Y1; Aliquippa, Pa. J5. Fontana, Calif. K1 quotes 11½ points lower on ½" and larger continuous weld and 24% on 3½" and 4". Columns B & E: Sparrows Point, Md. B2.

Columns C & F: Indiana Harbor, Ind., ⅛" through 3", Y1; Alton, Ill. (Gary base) L1.

Column D: Butler, Pa. F6, ⅛-⅜"; Benwood, W. Va. W10, except plus 3½% on ⅛", plus 2½% on ¼", plus 9% on ⅜"; Sharon, Pa. M6, plus 0.5 on ⅛". 1 point lower on ¼", ⅜", 1½ points lower on 1" and 1¼", 2 points lower on 1½", 2", 2½" and 3". Following quote only on ½" and larger; Lorain, O. N3 (Youngstown R2, and 16½% on 3½" and 4"; Youngstown Y1. Aliquippa, Pa. J5 quotes 1 point lower on ⅜", 2 points lower on 1", 1½ points lower on 1¼". 2 points lower on 1½" and 2", 1½ points lower on 2½" and 3"; Etna, Pa. N2 and 18½% on 3½" and 4".

SEAMLESS AND ELECTRIC WELD Size Inches	List Per Ft	Pounds Per Ft	Carload Discounts from List, % Seamless Black A	Seamless Galv. B	Elec. Weld Black C	Elec. Weld Galv. D
2	37.0c	3.68	29.5	9.5	29.5	9.5
2½	58.5	5.82	32.5	12.5	32.5	12.5
3	76.5	7.62	32.5	12.5	32.5	12.5
3½	92.0	9.20	34.5	14.5	34.5	14.5
4	$1.09	10.89	34.5	14.5	34.5	14.5
5	1.48	14.81	37.0	17.0	37.0	17.0
6	1.92	19.18	37.0	17.0	37.0	17.0

Column A: Aliquippa J5; Ambridge N2; Lorain N3; Youngstown Y1.

Column B: Aliquippa J5 quotes 1¼ pts lower on 2", 1 pt lower on 2½-6 in.; Lorain N3; Youngstown Y1.

Columns C & D: Youngstown R2.

BOILER TUBES

Net base c.l. prices, dollars per 100 ft, mill, minimum wall thickness, cut lengths 10 to 24 ft, inclusive.

O.D. In.	B.W. Ga.	Seamless H.R.	Seamless C.D.	Elec. Weld H.R.	Elec. Weld C.D.
1	13	13.45	16.47	15.36	15.36
1¼	13	16.09	19.71	15.61	18.19
1½	13	17.27	21.15	17.25	20.30
1¾	13	19.29	23.62	19.62	23.06
2	13	21.62	26.48	21.99	25.86
2¼	13	24.35	29.82	24.50	28.84
2¼	12	26.92	32.97	26.98	31.76
2½	12	29.65	36.32	29.57	34.76
2¾	12	32.11	39.33	31.33	36.84
3	12	34.00	41.64	32.89	38.70

CLAD STEELS

(Cents per pound)

Cladding Stainless	Plates— Carbon Base 10%	Plates— Carbon Base 20%	Strip— Cold-Rolled Carbon Base 10%	Strip— Cold-Rolled Carbon Base Both Sides	Sheets— Carbon Base 10%	Sheets— Carbon Base 20%	Sheets— Cu Base Both Sides
302	....	....	....	....	19.75	27.50	77.00
304	25.00	28.00– 29.50	....	....	20.75– 24.50	27.50	77.00
309	30.50	35.00	....	....	....	....	....
310	36.50	41.00	....	....	....	....	144.00
316	29.50	31.50– 34.00	....	....	26.00	36.50	....
317	34.50	39.00	....	....	....	....	....
318	38.50	38.00	....	....	....	....	....
321	26.50	31.00	....	....	23.00	33.00	111.00
347	27.50	30.50– 32.00	....	....	24.00	33.50	130.00
405	21.25	27.75	....	....	....	....	....
410	20.75	27.25	....	....	....	....	165.00
Nickel	33.25	44.25	41.00	54.00	....	....	....
Inconel	41.00	53.50	....	....	....	....	....
Monel	34.75	45.75	....	....	....	....	....
Copper*	....	....	23.70†	29.65‡	....	....	....

* Deoxidized. † 20.20c for hot-rolled. ‡ 26.40c for hot-rolled. Production points for carbon base products: Stainless plates, sheet, Conshohocken, Pa. A3 and New Castle, Ind. I-4; stainless-clad plates: Claymont, Del. C22, Coatesville, Pa. L7 and Washington, Pa. J3; nickel, inconel, monel-clad plates, Coatesville, Pa. L7; nickel, monel, copper-clad strip, Carnegie, Pa., S18. Production point for copper-base sheets is Carnegie, Pa. A13.

BOLTS, NUTS

CARRIAGE, MACHINE BOLTS (f.o.b. midwestern plants; per cent off list for less than carlots to consumers)

½-in. and shorter:

½-in. & smaller diam.	15
⅝-in. & ⅝-in.	+8.5
¾-in. and larger	17.5

Longer than 6 in.:

All diams.	14

Lag bolts, all diams.:

6 in. and shorter	23
over 6 in. long	21
Ribbed Necked Carriage	18.5
Blank	34
Plow	34
Step, Elevator, Tap, and Sleigh Shoe	21
Tire bolts	12
Boiler & Fitting-Up bolts	31

NUTS

H.P. & C.P. Square:	Reg.	Heavy
½-in. & smaller	15	15
⅝-in. & ⅝-in.	12	6.5
¾-in.-1½-in.	9	1
1⅝-in. & larger	7.5	1
H.P. Hex:		
½-in. & smaller	26	22
⅝-in. & ⅝-in.	16.5	6.5
¾-in.-1½-in.	12	2
1⅝-in. & larger	8.5	2
C.P. Hex.:		
½-in. & smaller	26	22
⅝-in. & ⅝-in.	23	17.5
¾-in. & 1⅛-in.	19.5	12
1⅝-in. & larger	12	6.5

SEMIFINISHED NUTS

American Standard

(Per cent off list for less than case or key quantities)

	Reg.	Hvy.
½-in. & smaller	35	28.5
⅝-in. & ⅝-in.	29.5	22
¾-in.-1½-in.	24	15
1⅝-in. & larger	13	8.5
	Light	
⅞-in. & smaller	35	
1-in. to 1½-in.	28.5	
1⅝-in. to 1½-in.	26	

STEEL STOVE BOLTS

(F.o.b. plant; per cent off list in packages)

Plain finish	48 & 10
Plated finishes	31 & 10

HEXAGON CAP SCREWS

(1020 steel; packaged; per cent off list)

6 in. or shorter:

⅝-in. & smaller	42
¾-in. through 1 in.	34

Longer than 6 in.:

⅝-in. & smaller	26
¾-in. through 1 in.	4

SQUARE HEAD SET SCREWS

(Packaged; per cent off list)

1 in. diam. x 6 in. and shorter 38

1 in. and smaller diam. x over 6 in. 26

HEADLESS SET SCREWS

(Packaged; per cent off list)

No. 10 and smaller	35
¼-in. diam. & larger	16
N.F. thread, all diams.	10

RIVETS

F.o.b. midwestern plants

Structural ½-in., larger 7.85c

⅞-in. under ..... 36 off

WASHERS, WROUGHT

F.o.b. shipping point, to jobbers ...List to list-plus-$E.

ELECTRODES

(Threaded, with nipples, unboxed, f.o.b. plant)

GRAPHITE

Diam.	Length	Cents per lb
17,18,20	60,72	17.85
8 to 16	48,60,72	17.85
7	48,60	19.57
6	48,60	20.95
4.5½	40	21.50
3	40	22.61
2½	24,30	23.15
2	24,30	25.36

CARBON

40	100,110	8.03
35	100,110	8.03
30	84,110	8.03
24	72 to 104	8.03
17 to 20	34,90	8.03
14	60,72	8.57
10,12	60	8.84

STAINLESS STEEL

Type	Sheets	C.R. Strip	Bars Wire Structurals
301	41.00	34.00	31.25
302	41.25	36.75	31.50
303	43.25	40.25	34.00
304	43.25	38.75	33.00
309	56.00	55.00	44.75
316	57.00	59.00	49.25
321	49.25	48.25	37.00
347	53.75	52.25	41.50
410	36.50	30.50	25.75
416	37.00	37.00	26.25
420	44.00	47.00	31.25
430	39.00	31.00	26.25
501	27.50	26.00	14.25
502	28.50	27.00	15.25

Baltimore, Types 301 through 347 sheet, except 303 and 308 E2.

Brackenridge, Pa., sheets A4 quotes slight variations on Types 301-347.

Bridgeville, Pa., bars, wire, sheets & strip U4.

Carnegie, Pa., sheets and strip except Types 303, 416, 501 & 502 and 0.25c lower on Types 302, 304, 321, 347; 0.50c lower on Types 309 and 316 S18.

Cleveland, strip A7.

Detroit, strip M1 quotes 34.00 on Type 301, 36.50 on 302, 38.50 on 304, 58.50 on 316, 52.00 on 347, 30.50 on 410, and 31.00 on 430.

Dunkirk, N. Y., bars, wire A4 quotes slight variations on Types 301-347.

Duquesne, Pa., bars U5.

Fort Wayne, Ind., bars and wire, except Type 501 & 502 J6 quotes slight variations on Types 301-347.

Gary, Ind., sheets except Type 416 U5.

Harrison, N. J., strip and wire C18.

Massillon, O., all products, R2.

McKeesport, Pa., strip, Type 410; bars & wire, Types 410 through 430 and 31.25c on Type 302, 33.75c on 303, 32.75c on 304, 48.75c on 316, 56.75c on 321, 41.25c on 347 F2.

McKeesport, Pa., bars, sheets except Type 416 U5.

Midland, sheets & strip C18.

Munhall, Pa., bars U5.

Pittsburgh, sheets C18.

Sharon, Pa., strip, except Types 303, 309, 416, 501, 502 and 34.25 on Type 301 S3.

So. Chicago, Ill., bars & structurals U5.

Syracuse, N. Y., bars, wire & structurals C18.

Titusville, Pa., bars U4.

Wallingford, Conn., strip, W2 quotes 0.25 higher.

Washington, Pa., bars, sheets & strip, except 0.25c higher on Type 301 J3.

Washington, Pa., Types 301 through 347 sheets & strip except 303, 309, 316 sheets 62.00c, strip 64.00c, W4.

Watervliet, N. Y., structurals & bars A4 quotes slight variations on Types 301-347.

Waukegan, bars & wire A7.

West Leechburg, Pa., strip, A4 quotes slight variations on Types 301-347.

COAL CHEMICALS

Spot, cents per gallon, ovens	
Pure benzol	.30.00-35.00
Toluol, one deg.	.26.00-33.00
Industrial xylol	.25.00-33.50
Per ton bulk, ovens	
Sulphate of ammonia	$32-$45
Cents per pound, ovens	
Phenol, 40 (carlots, non-returnable drums)	...17.25

FLUORSPAR

Metallurgical grade, f.o.b. shipping point, in Ill., Ky., net tons, carloads, effective CaF_2 content, 70%, $43; 60%, $40.

Imported, net ton, duty paid, metallurgical grade, $33-$35.

METAL POWDERS

(Per ton, f.o.b. shipping point in ton lots for minus 100 mesh, except as otherwise noted.)

	Cents
Sponge iron	
98+% Fe, carlots	16.00
Swedish, c.i.f. New York, in bags	7.40-8.50
Electrolytic Iron:	
Annealed, 99.5% Fe	42.50
Unannealed, 99 + % Fe	36.50
Unannealed, 99 + % Fe (minus 325 mesh)	58.50
Powder Flakes	48.50
Carbonyl Iron: 97.9-99.8%, size 5 to 10 microns	...53.00-148.00
Aluminum:	
Carlots, freight allowed	29.50
Atomized, 500 lb drums, freight allowed	33.50
Brass, 10-ton lots	30.00-33.25
Bronze, 10-ton lots	...51.25-60.00
Phosphor-Copper, 10 tons	50.00
Copper:	
Electrolytic	43.25
Reduced	...33.75-37.00
Lead	25.50
Magnesium	...75.00-85.00
Manganese:	
Minus 100-mesh	57.00
Minus 35 mesh	52.00
Minus 200 mesh	62.00
Nickel unannealed	83.00
Nickel-Silver, 10-ton lots	44.00
Silicon	38.50
Solder (plus cost of metal)	8.50
Stainless Steel, 302	83.00
Zinc, 10-ton lots	23.00-30.50
Tungsten:	Dollars
99%, minus 80 to 200 mesh, freight allowed: 1000 lb and over	4.00
Less than 1000 lb	4.15
98.8% minus 65 mesh, freight allowed: 1000 lb and over	4.15
Less than 1000 lb	4.25
Molybdenum:	
99%, minus 80 to 200 mesh, over 500 lb	2.85
200 to 500 lb	3.10
less than 200 lb	3.25
Chromium, electrolytic, 99% Cr min.	3.50

METALLURGICAL COKE

Price per net ton

BEEHIVE OVENS

Connellsvll.fur.	$14.50-15.00
Connellsvll.fdry.	17.00-18.00
New River, foundry	21.30
Wise county, foundry	15.95
Wise county, furnace	15.20

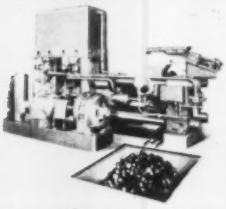
OVEN FOUNDRY COKE

Kearney, N. J., ovens	$22.75
Everett, Mass., ovens	
New England, del.	*24.80
Chicago ovens	23.00
Chicago, del.	24.40
Terre Haute, ovens	22.50
Milwaukee, ovens	23.75
Indianapolis, ovens	22.75
Chicago, del.	26.28
Cincinnati, del.	25.75
Detroit, del.	26.71
Ironton, O., ovens	22.50
Cincinnati, del.	25.12
Painesville, O., ovens	24.00
Cleveland, del.	25.75
Erie, Pa., ovens	23.50
Birmingham, ovens	20.30
Birmingham, del.	21.69
Philadelphia, ovens	22.70
Neville Island, Pa., ovens	23.00
Swedeland, Pa., ovens	22.60
St. Louis, ovens	
St. Louis, del.	25.40
Portsmouth, O., oven	22.50
Cincinnati, del.	25.12
Detroit, ovens	24.00
Detroit, del.	25.00
Buffalo, del.	26.75
Flint, del.	26.49
Pontiac, del.	25.42
Saginaw, del.	26.81

* Or within $4.15 freight zone from works.

When the SQUEEZE is on

RECLAIM VITAL SCRAP!

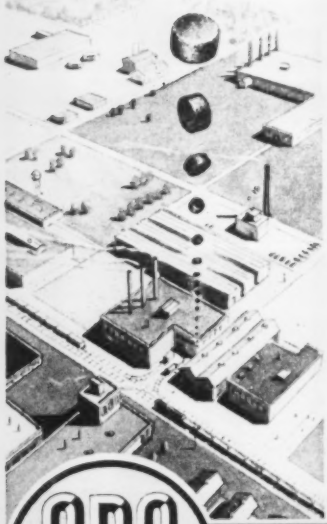


Conserve critical metals, increase self-sufficiency, and reduce scrap handling and storage problems with a MILWAUKEE Briquetting Press. This machine efficiently converts bulk borings, turnings, chips and shavings AUTOMATICALLY into dense cylindrical briquettes that are classified as **high grade scrap**, suitable for direct charging into foundry cupola or furnace.

Steel, cast iron, bronze, magnesium, aluminum, brass and other metals all can be "briquetted" by means of a MILWAUKEE Press. It keeps scrap in your own hands and facilitates quality control. In addition, a MILWAUKEE briquetting press conserves vital time and space required for bulk scrap handling.

Capable of converting from ¾ to more than 3½ tons of scrap per hour, hydraulically-operated MILWAUKEE presses require minimum space and maintenance. Six different sizes are available to meet specific production requirements.

Now that the "squeeze" is on, leading manufacturers in the metal working industry are utilizing MILWAUKEE briquetting presses to solve their vital material and scrap problems. Write today for Bulletin No. 117 containing data, specifications and case history information on MILWAUKEE AUTOMATIC HYDRAULIC BRIQUETTING PRESSES.



SPO

MILWAUKEE *Foundry Equipment Division*

CASTINGS ARE PERMANENT

6495 Grand Division Avenue • Cleveland 25, Ohio

WAREHOUSE STEEL PRODUCTS

(Prices, cents per pound, for delivery within switching limits, subject to extras)

	SHEETS			STRIP		BARS			Standard Structural Shapes	PLATES	
	H.R. 18 Ga., Hexagon*	C.R.	Gal. 10 Ga.†	H.R.*	C.R.*	H.R. Rds.	C.F. Rds.	H.R. Alloy 4140§		Carbon	Floor
New York (city)	[redacted]	7.29	8.44	6.59	...	6.42	7.29	9.25	6.40	6.58	8.04
New York (c'try)	[redacted]	6.99	8.14	6.29	...	6.12	6.99	8.95	6.10	6.28	7.74
Boston (city) ..	6.40	7.20	8.49	6.35	...	6.25	7.04	9.25	6.40	6.98	7.88
Boston (c'try) .	6.20	7.00	8.29	6.15	...	6.05	6.84	9.05	6.20	6.78	7.68
Phila. (city) ..	6.15	7.05	8.25	6.35	...	6.30	7.11	8.90	6.15	6.30	7.40
Phila. (c'try) ..	5.80	6.80	8.00	6.10	...	6.05	6.86	8.65	5.90	6.05	7.15
Balt. (city) ..	5.80	7.04	8.27	6.24	...	6.24	7.09	...	6.34	6.00	7.64
Balt. (c'try) ..	5.60	6.84	8.07	6.04	...	6.04	6.89	...	6.14	5.80	7.44
Norfolk, Va. ..	6.50	...	...	6.70	...	6.55	7.70	...	6.60	6.50	8.00
Richmond, Va. .	5.90	...	8.10	6.10	...	6.10	6.90	...	6.30	6.05	7.80
Wash. (w'hse) .	6.02	7.26	8.49	6.46	...	6.46	7.26	...	6.56	6.22	7.86
Buffalo (del.) ..	5.80	6.60	8.29	6.06	...	5.80	6.65	10.65††¶	6.00	6.25	7.55
Buffalo (w'hse).	5.60	6.40	8.09	5.86	...	5.60	6.45	10.45††¶	5.80	6.05	7.35
Pitts. (w'hse) ..	5.60	6.40*	7.75	5.65-5.95	6.90	5.55	6.40	10.10††	5.70	5.75	7.00
Detroit (w'hse).	5.45-5.78	6.53-6.80	7.99	5.94-5.95	7.75	5.84	6.56	8.91	6.09	6.19-6.35	7.28
Cleveland (del.)	5.80	6.60	8.30	5.89	7.10	5.77	6.60-6.70	8.91	10.02	6.12	7.32
Cleve. (w'hse) .	5.60	6.40	8.10	5.69	6.90	5.57	6.40-6.50	8.71	5.82	5.92	7.12
Cincin. (city) ..	6.02	6.59	7.34	5.95	...	5.95	6.51	...	6.24	6.34	7.50
Chicago (city) .	5.80	6.60	7.95	5.75	...	5.75	6.50	10.30	5.90	6.00	7.20
Chicago (w'hse)	5.60	6.40	7.75	5.55	...	5.55	6.30	10.10	5.70	5.80	7.00
Milwaukee (city)	5.94	6.74	8.09	5.89	...	5.89	6.74	10.44	6.04	6.14	7.34
Milwau. (c'try).	5.74	6.54	7.89	5.69	...	5.69	6.54	10.24	5.84	5.94	7.14
St. Louis (del.).	6.05	6.85	8.20	6.00	...	6.00	6.85	10.55	6.23	6.33	7.53
St. L. (w'hse) .	5.85	6.65	8.00	5.80	...	5.80	6.65	10.35	6.03	6.13	7.33
Kans. City (city)	6.40	7.20	8.40	6.35	...	6.35	7.20	...	6.50	6.60	7.80
KansCity (w'hse)	6.20	7.00	8.20	6.15	...	6.15	7.00	...	6.30	6.40	7.60
Birm'hm (city) .	5.75	6.55	6.90[2]	5.70	...	5.70	7.53	...	5.85	6.10	8.25
Birm'hm (w'hse)	5.60	6.40	6.75[2]	5.55	...	5.55	7.53	...	5.70	5.95	8.23
Los Ang. (city)	6.55	8.10	9.05[2]	6.60	8.90	6.55	7.75	...	6.55	6.60	9.20
L. A. (w'hse) ..	6.35	7.90	8.85[2]	6.40	8.70	6.35	7.55	...	6.35	6.40	8.70
San Francisco..	6.65	7.80[2]	8.90[2]	6.60	...	6.45	8.20	...	6.45	6.50	8.60
Seattle-Tacoma .	7.05	8.60[2]	9.20[2]	7.30	...	6.75	9.10	11.15	6.65	6.75	8.80

* Prices do not include gage extras; † prices include gage and coating extras, except Birmingham (coating extra excluded) and Los Angeles (gage extra excluded; ‡ includes extra for 10 gage; § as rolled; †† as annealed. Base quantities, 2000 to 9999 lb except as noted: Cold-rolled strip, 2000 lb and over; cold-finished bars, 2000 lb and over; [2]—500 to 1499 lb; [3]—450 to 1499 lb; ¶—3500 lb and over; [8]—1000 to 1999 lb.

ORES

Lake Superior Iron Ore

Gross ton, 51½% (natural), lower lake ports.

After adjustment for analysis, prices will be increased or decreased as the case may be for increases or decreases after Dec. 2, 1950, in applicable lake vessel rates, upper lake rail freights, dock handling charges and taxes thereon.

Old range bessemer	$8.70
Old range nonbessemer	8.55
Mesabi bessemer	8.45
Mesabi nonbessemer	8.30
High phosphorus	8.30

Eastern Local Ore

Cents per unit, del. E. Pa.

Foundry and basic 56-62% concentrates contract	17.00

Foreign Ore

Cents per unit, c.i.f. Atlantic ports

Swedish basic, 60 to 68%:	
Spot	17.00
Long-term contract	15.00
North African hematites	15.75
Brazilian iron ore, 68-69%	18.00

Tungsten Ore

Net ton unit, duty paid

Foreign wolframite and scheelite, per net ton unit	$65.00
Domestic scheelite, mines	65.00

Manganese Ore

Indian manganese, 46-48%, nearby, 92.00-96.00c per long ton unit, c.i.f. U. S. ports, duty for buyer's account; shipments against old contracts for 48% ore are being received from some sources at 79.8-81.8c.

Chrome Ore

Gross ton, f.o.b. cars, New York, Philadelphia, Baltimore, Charleston, S. C., plus ocean freight differential for delivery to Portland, Oreg., or Tacoma, Wash.

Indian and African

48% 2.8:1	$32.50
48% 3:1	35.00-36.00
48% no ratio	26.00

South African Transvaal

44% no ratio	$27.00-28.00
48% no ratio	34.00-35.00

Brazilian

44% 2.5:1 lump	$32.00

Rhodesian

45% no ratio	$20.00-21.00
48% no ratio	26.00
48% 3:1 lump	35.00-36.00

Domestic—rail nearest seller

48% 3:1	$39.00

Molybdenum

Sulphide concentrates per lb, molybdenum content, mines	$1.00

MANGANESE ALLOYS

Spiegeleisen: (19-21% Mn, 1-3% Si). Carlot per gross ton, $75, Palmerton, Pa.; $75, Pittsburgh and Chicago; (16% to 19% Mn) $1 per ton lower.

Standard Ferromanganese: (Mn 78-82%, C 7% approx.) Carload, lump, bulk $185 per gross ton of alloy, c.l. packed, $197; gross ton lots, packed, $212; less gross ton lots, packed, $229; f.o.b. Alloy, W. Va., Niagara Falls, N. Y., Welland, Ont., or Ashtabula, O. Base price: $187, Johnstown, Pa.; $185, Sheridan, Pa.; $188, Etna, Pa.; $190, Chattanooga, Tenn. Shipment from Pacific Coast warehouses by one seller add $33 to above prices, f.o.b. Los Angeles, Oakland, Portland, Oreg. Shipment from Chicago warehouse, ton lots $227; less gross ton lots, $244 f.o.b. Chicago. Add or subtract $2.30 for each 1% or fraction thereof, of contained manganese over 82% and under 78%, respectively.

Low-Carbon Ferromanganese, Regular Grade: (Mn 85-90%). Carload, lump, bulk, max. 0.07% C, 25.75c per lb of contained Mn, carload packed 26.5c, ton lots 27.6c, less ton 28.5c. Delivered. Deduct 0.5c for max. 0.15% C grade from above prices, 1c for max. 0.30% C, 1.5c for max. 0.50% C, and 4.5c for max. 75% C—max. 7% Si. **Special Grade:** (Mn 90% min., C 0.07% max., P 0.06% max.). Add 0.5c to above prices. Spot, add 0.25c.

Medium-Carbon Ferromanganese: (Mn 80-85%, C 1.5% max.). Carload, lump, bulk 19.15c per lb of contained Mn, carload packed 19.9c, ton lot 21.0c, less ton 22.2c. Delivered. Spot, add 0.25c.

Manganese metal, 2" x D (Mn 96% min., Fe 2% max., Si 1% max., C 0.2% max.): Carload lump bulk, 34c per lb of metal; packed, 34.75c; ton lot 36.25c; less ton lot 38.25c. Delivered. Spot, add 2c.

Manganese Electrolytic: 250 lb to 1999 lb, 32c; 2000 to 39,999 lb, 30c; 40,000 lb or more, 28c. Premium for hydrogen-removed metal 1.5c per pound, f.o.b. cars Knoxville, Tenn. Freight allowed to St. Louis or to any point east of Mississippi.

Silicomanganese: (Mn 65-68%). Contract, lump bulk, 1.50% C grade, 18-20% Si 9.90c per lb of alloy, carload packed, 10.65c, ton lot 11.55c, less ton 12.55c. Freight allowed. For 2% C grade, Si 15-17%, deduct 0.2c from above prices. For 3% C grade, Si 12-14.5%, deduct 0.5c from above prices. Spot, add 0.25c.

TITANIUM ALLOYS

Ferrotitanium, Low-Carbon: (Ti 20-25%, Al 3.5% max., Si 4% max., C 0.10% max.) Contract, ton lot 2" x D, $1.50 per lb of contained Ti; less ton $1.55. (Ti 38-43%, Al 8% max., Si 4% max., C 0.10% max.) Ton lot $1.35, less ton $1.37, f.o.b. Niagara Falls, N. Y., freight allowed to St. Louis. Spot, add 5c.

Ferrotitanium, High-Carbon: (Ti 15-18%, C 6-8%). Contract $177 per net ton, f.o.b. Niagara Falls, N. Y., freight allowed to destinations east of Mississippi river and north of Baltimore and St. Louis.

Ferrotitanium, Medium-Carbon: (Ti 17-21%, C 2-4.5%). Contract, $195 per ton, f.o.b. Niagara Falls, N. Y., freight not exceeding St. Louis rate allowed.

OTHER FERROALLOYS

Ferrocolumbium: (Cb 56-60%, Si 8% max., C 0.4% max.). Contract, ton lot, 2" x D, $4.90 per lb of contained Cb, less ton $4.95. Delivered. Spot, add 10c.

Ferrotantalum—Columbium: (Cb 40% approx., Ta 20% approx., and Cb and Ta 60% min., C 0.30 max.) ton lots, 2" x D, $3.75 per lb of contained Cb plus Ta, deld.; less ton lots $3.80.

Silcaz Alloy: (Si 35-40%, Ca 9-11%, Al 6-8%, Zr, 3-5%, Ti 9-11%, B 0.35-0.75%). Carload packed, 1" x D, 45c per lb of alloy, ton lot 47c, less ton 49c. Delivered.

SMZ Alloy: (Si 60-65%, Mn 5-7%, Zr 5-7%, Fe 20% approx.). Contract, carload, packed, ½" x 12 M, 17.5c per lb of alloy, ton lots 18.25c, less ton 19.5c, Deld. Spot, add 0.25c.

Graphidox No. 4: (Si 48-52%, Ca 5-7%, Ti 9-11%). C.l. packed, 18c per lb of alloy; ton lots 19c; less ton lots 20.50c, f.o.b. Niagara Falls, N. Y.; freight allowed to St. Louis.

V-5 Foundry Alloy: (Cr 38-42%, Si 17-19%, Mn 8-11%). C.l. packed, 15c per lb of alloy; ton lots 16.50c; less ton lots 17.75c, f.o.b., Niagara Falls; freight allowed to St. Louis.

Simanal: (Approx. 20% each Si, Mn, Al; bal. Fe) Lump, carload, bulk 14.50c, packed 15.50c; ton lots, packed, 15.75c; less ton lots, packed, 16.25c per lb of alloy, delivered to destination within United States.

Ferrophosphorus: (23-25% based on 24% P content with unitage of $3 for each 1% of P above or below the base); carloads, f.o.b. sellers' works, Mt. Pleasant, or Siglo, Tenn., $65 per gross ton.

Ferromolybdenum: (55-75%). Per lb, contained Mo, f.o.b. Langeloth, $1.32; Washington, Pa., furnace, any quantity $1.32.

Technical Molybdic-Oxide: Per lb, contained Mo, f.o.b. Langeloth $1.14, packed in bags containing 20 lb of molybdenum; Washington, Pa., $1.13.

Note: Current prices on chromium, silicon, vanadium, boron and tungsten alloys appeared on page 115, July 30 issue; calcium, zirconium and briquetted alloys, page 161, Aug. 6. Refractories prices also were published on page 161, Aug. 6 issue.

CEILING PRICES, IRON AND STEEL SCRAP

Prices as set forth in Office of Price Stabilization ceiling price regulation No. 5, as amended Apr. 19, 1951

STEELMAKING SCRAP COMPOSITE

Aug. 9	$41.00
Aug. 2	41.00
July 1951	44.00
Aug. 1950	40.00
Aug. 1946	19.17

Based on No. 1 heavy melting grade at Pittsburgh, Chicago and eastern Pennsylvania.

Basing point ceiling prices per gross ton from which maximum shipping prices are computed on scrap of dealer and industrial origin; and from which ceiling on-line and ceiling delivered prices are computed on scrap of railroad origin.

No. 1 Heavy Melting Steel (Grade) 1

Basing Point	Dealer, Industrial	Railroad
Alabama City, Ala.	$39.00	$41.00
Ashland, Ky.	42.00	44.00
Atlanta, Ga.	39.00	41.00
Bethlehem, Pa.	42.00	44.00
Birmingham, Ala.	39.00	41.00
Brackenridge, Pa.	44.00	46.00
Buffalo, N. Y.	43.00	45.00
Butler, Pa.	44.00	46.00
Canton, O.	44.00	46.00
Chicago, Ill.	42.50	44.50
Cincinnati, O.	43.00	45.00
Claymont, Del.	42.50	44.50
Cleveland, O.	43.00	45.00
Coatesville, Pa.	42.50	44.50
Conshohocken, Pa.	42.50	44.50
Detroit, Mich.	41.15	43.15
Duluth, Minn.	40.00	42.00
Harrisburg, Pa.	42.50	44.50
Houston, Tex.	37.00	39.00
Johnstown, Pa.	44.00	46.00
Kansas City, Mo.	39.50	41.50
Kokomo, Ind.	42.00	44.00
Los Angeles	35.00	37.00
Middletown, O.	43.00	45.00
Midland, Pa.	44.00	46.00
Minneapolis, Colo.	38.00	40.00
Monessen, Pa.	44.00	46.00
Phoenixville, Pa.	42.50	44.50
Pittsburg, Calif.	35.00	37.00
Pittsburgh, Pa.	44.00	46.00
Portland, Oreg.	35.00	37.00
Portsmouth, O.	42.00	44.00
St. Louis, Mo.	41.00	43.00
San Francisco	35.00	37.00
Seattle, Wash.	35.00	37.00
Sharon, Pa.	44.00	46.00
Sparrows Point, Md.	42.00	44.00
Steubenville, O.	44.00	46.00
Warren, O.	44.00	46.00
Weirton, W. Va.	44.00	46.00
Youngstown, O.	44.00	46.00

Differentials from Base

Differentials per gross ton for other grades of dealer and industrial scrap:

O-H and Blast Furnace Grades	
2. No. 2 Heavy Melting	—$2.00
3. No. 1 Busheling	Base
4. No. 1 Bundles	Base
5. No. 2 Bundles	— 3.00
6. Machine Shop Turnings	—10.00
7. Mixed Borings & Short Turnings	— 6.00
8. Shoveling Turnings	— 6.00
9. No. 2 Busheling	— 4.00
10. Cast Iron Borings	— 6.00
Elec. Furnace and Fdry. Grades	
11. Billet, Bloom & Forge Crops	+ 7.50
12. Bar Crops & Plate	+ 5.00
13. Cast Steel	+ 5.00
14. Punchings & Plate Scrap	+ 2.50
15. Electric Furnace Bundles	+ 2.00
Cut Structurals & Plate:	
16. 3 feet and under	+ 3.00
17. 2 feet and under	+ 5.00
18. 1 foot and under	+ 6.00
19. Briquetted Cast Iron Borings	Base
Foundry, Steel:	
20. 2 feet and under	+ 2.00
21. 1 foot and under	+ 4.00
22. Springs and Crankshafts	+ 1.00
23. Alloy Free Turnings	— 3.00
24. Heavy Turnings	— 1.00

Special Grades

25. Briquetted Turnings	Base
26. No. 1 Chemical Borings	— 3.00
27. No. 2 Chemical Borings	— 4.00
28. Wrought Iron	+ 10.00
29. Shafting	+ 10.00

Restrictions on Use

(1) Prices for Grades 11 and 23 may be charged only when shipped to a consumer directly from an industrial producer, otherwise ceiling prices shall not exceed prices established for Grades 12 and 9, respectively. (2) Prices established for Grades 26 and 27 may be charged only when sold for use for chemical or annealing purposes, and in the case of Grade 27, for briquetting and direct charge into an electric furnace; otherwise ceiling prices shall not exceed price established for Grade 10. (3) Prices established for Grade 28 may be charged only when sold to a producer of wrought iron; otherwise ceiling price shall not exceed ceiling price for corresponding grade of basic open-hearth. (4) Premiums for Grades 11-18, 20 and 21 may be charged only when sold for use in electric and open-hearth furnaces of foundries. (5) Prices for Grade 29 may be charged only when sold for forging or rerolling purpose.

Special Pricing Provisions

(1) Sellers of Grades 26 and 27 may make an extra charge of $1.50 per ton for loading in box cars, or 75 cents per ton for covering gondola cars with a weather-resistant covering.

(2) Ceiling price of pit scrap, ladle scrap, salamander scrap, skulls, skimmings of scrap recovered from slag dumps and prepared to charging box size, shall be computed by deducting from the price of No. 1 heavy melting steel of dealer and industrial origin the following amounts: Where iron content is 85% and over, $6; 75% and over, $10; less than 75%, $12.

(3) Ceiling price of any inferior grade of scrap not listed shall not exceed the price of No. 1 heavy melting steel less $15.

Differentials from Base

Differentials per gross ton above or below the price of Grade 1 (No. 1 railroad heavy melting steel) for other grades of railroad steel scrap.

2. No. 2 Heavy melting Steel	—$2.00
3. No. 2 Steel Wheels	Base
4. Hollow Bored Axles and loco. axles with keyways between the wheelseats	Base
5. No. 1 Busheling	— 3.50
6. No. 1 Turnings	— 3.00
7. No. 2 Turnings, Drillings & Borings	—12.00
8. No. 2 Cast Steel and uncut wheelcenters	— 6.00
9. Uncut Frogs, switches	Base
10. Flues, Tubes & Pipes	— 8.00
11. Structural, Wrought Iron and/or steel, uncut	— 6.00
12. Destroyed Steel Cars	— 4.00
13. No. 1 Sheet Scrap	— 5.50
14. Scrap Rails, Random Lengths	+ 2.00
15. Rerolling Rails	+ 7.00
Cut Rails:	
16. 3 feet and under	+ 5.00
17. 2 feet and under	+ 6.00
18. 18 inches and under	+ 8.00
19. Cast Steel, No. 1	+ 3.00
20. Uncut Tires	+ 2.00
21. Cut Tires	+ 5.00
Bolsters & Side Frames:	
22. Uncut	Base
23. Cut	+ 3.00
24. Angle Splice Bars & Tie Plates	+ 5.00
25. Solid Steel Axles	+ 12.00
26. Steel Wheels, No. 3 diameter	Base
27. Steel Wheels, No. 3	+ 5.00
28. Spring Steel	+ 5.00
29. Couplers & Knuckles	+ 5.00
30. Wrought Iron	+ 8.00
31. Fireboxes	— 8.00
32. Boilers	— 6.00
33. No. 2 Sheet Scrap	—12.00
34. Carsides, Doors, Car Ends cut apart	— 6.00

Restrictions on Use

(1) Price established for Grade 15 may be charged only when purchased and sold for rerolling uses; otherwise, ceiling shall not exceed that for Grade 14. (2) Price established for Grade 30 may be charged only when sold to a producer of wrought iron; otherwise ceiling shall not exceed that for No. 1 heavy melting steel. (3) Price for Grade 25 may be charged only when sold for rerolling and forging purposes; otherwise ceiling shall not exceed that for base grade (No. 1).

CAST IRON SCRAP

Ceiling price per gross ton for following grades shall be f.o.b. shipping point:

Cast Iron:	
1. No. 1 (Cupola)	$49.00
2. No. 2 (Charging Box)	47.00
3. No. 3 (Hvy. Breakable)	45.00
4. No. 4 (Burnt Cast)	41.00
5. Cast Iron Brake Shoes	41.00
6. Stove Plate	46.00
7. Clean Auto Cast	52.00
8. Unstripped Motor Blocks	43.00
9. Wheels, No. 1	47.00
10. Malleable	55.00
11. Drop Broken Machinery	52.00

Restrictions on Use

(1) Ceiling shipping point price which a basic open-hearth consumer may pay for No. 1 cast iron, clean auto cast, malleable or drop broken machinery cast shall be ceiling price for No. 3 cast iron.

(2) Ceiling shipping point price which any foundry other than a malleable iron producer may pay for Grade 10 shall be ceiling price for No. 1 cast iron.

Preparation Charges

Ceiling fees per gross ton which may be charged for intransit preparation of any grade of steel scrap of dealer or industrial origin authorized by OPS are:

(1) For preparing into Grades No. 1, No. 2 or No. 3, $8.
(2) For hydraulically compressing Grade No. 4, $6 per ton; Grade No. 5, $8.
(3) For crushing Grade No. 6, $3.
(4) For preparing into Grade No. 25, $6.
(5) For preparing into Grade No. 19, $6.
(6) For preparing into Grades No. 12, No. 13, No. 14, No. 16, or No. 20, $10.
(7) For preparing into Grade No. 17 or Grade No. 21, $11.
(8) For preparing into Grade No. 18 or Grade No. 20, $12.
(9) For hydraulically compressing Grade No. 15, $8.
(10) For preparing into Grade No. 28, $10.

Ceiling fees per gross ton which may be charged for intransit preparation of any grade of steel scrap of railroad origin shall be:

(1) For preparing into Grade No. 1 and Grade No. 2, $8.
(2) For hydraulically compressing Grade No. 13, $6.
(3) For preparing into Grade No. 16, $4.
(4) For preparing into Grade No. 17, $5.
(5) For preparing into Grade No. 18, $7.
(6) For preparing into Grade No. 21, $4.
(7) For preparing into Grade No. 23, $4.

Ceiling fees per gross ton which may be charged for intransit preparation of cast iron are limited to:

(1) For preparing Grade No. 8 into grade No. 7, $9.
(2) For preparing Grade No. 3 into Grade No. 11, $7.
(3) For preparing Grade No. 3 into Grade No. 1, $4.

Whenever scrap has arrived at its point of delivery and consumer engages a dealer to prepare such scrap, no fee may be charged for such services unless consumer obtains prior written OPS approval.

Commissions

No commissions shall be payable to a broker in excess of $1.

Unprepared Scrap

For unprepared scrap, other than materials suitable for hydraulic compression, ceiling basing point prices shall be $8 per ton beneath ceiling of the prepared base grades.

For unprepared material which when compressed constitutes No. 1 bundles, ceiling basing point price shall be $6 per ton beneath ceiling for No. 1 bundles; or when compressed, constitutes No. 2 bundles ceiling basing point price shall be $8 beneath ceiling basing point price for No. 2 bundles.

Premiums for Alloy Content

No premium may be charged for alloy content except: $1.25 per ton for each 0.25% of nickel where scrap contains not less than 1% and not over 5.25% nickel; $2 per ton for scrap containing not less than 0.15 per cent molybdenum and $3 for scrap containing not less than 0.65% molybdenum, for scrap containing not less than 10% manganese, $4 for scrap in sizes larger than 12 x 24 x 8 in., and $14 for scrap cut in that size or smaller (applicable only if scrap is sold for electric furnace uses or on NPA allocation); $1 for scrap conforming to SAE 52100.

Switching Charges

Switching charges to be deducted from basing point prices of dealer, industrial and nonoperating railroad scrap, to determine ceiling shipping point prices for scrap originating in basing points are per gross ton: Alabama City, Ala., 43c; Ashland, Ky., 47c; Atlanta, 51c; Bethlehem, Pa., 52c; Birmingham, 50c; Brackenridge, Pa., 53c; Buffalo, 53c; Butler, Pa., 65c.

Canton, O., 51c; Chicago (including Gary, Ind.), $1.34; Cincinnati (including Newport, Ky.), 65c; Claymont, Del. (including Chester, Pa.), 79c; Cleveland, 76c.

Coatesville, Pa., 50c; Conshohocken, Pa., 20c.

Detroit, 95c; Duluth, Minn., 50c.

Harrisburg, Pa., 51c; Houston, Tex., 57c.

Johnstown, Pa., 75c.

Kansas City, Mo., 78c; Kokomo, Ind., 51c.

Middletown, O., 26c; Midland, Pa., 73c; Minneapolis, Colo., 33c; Monessen, Pa., 51c.

Phoenixville, Pa., 51c; Pittsburg, Calif., 65c; Pittsburgh (including Bessemer, Homestead, Duquesne, Munhall), 99c; Portland, Oreg., 52c; Portsmouth, O., 51c.

St. Louis (including Federal, Granite City, E. St. Louis, Madison, Ill.), 51c; San Francisco (including So. San Francisco, Niles, Oakland), 66c; Seattle, 59c; Sharon, Pa., 75c; Sparrows Point, Md., 20c; Steubenville, O., 51c.

Warren, Pa., 75c; Weirton, W. Va., 70c.

Youngstown, 75c.

HAMILTON, ONT.

(Delivered Prices)

Heavy Melt	$35.00
No. 1 Bundles	35.00
No. 2 Bundles	34.00
Mechanical Bundles	33.00
Mixed Steel Scrap	31.00
Mixed Borings, Turnings	28.00
Rails, Remelting	35.00
Rails, Rerolling	38.00
Busheling	29.50
Bushelings new factory, prep'd.	33.00
Bushelings new factory, unprep'd.	28.00
Bushelings, Short Steel Turnings	28.00
Cast Iron Grades*	
No. 1 Machinery Cast	58.00-60.00

* F.o.b. shipping point.

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LURIA BROTHERS AND COMPANY, INC.

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HOUSTON, TEXAS — 1114 Texas Av. Bldg.
PITTSBURGH, PA. — Oliver Building
BOSTON, MASS. — Statler Building
CLEVELAND, OHIO — 1022 Midland Bldg.
LEBANON, PENNA. — Luria Building
PUEBLO, COLORADO — 334 Colorado Bldg.
BUFFALO, N. Y. — Genesee Building
DETROIT, MICHIGAN — 2011 Book Building
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TO illustrate its uniformity, this *Normalized shot was magnified 50 times. It saves wear on cleaning equipment. It stands up under the toughest production conditions.

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THE CLEVELAND Metal Abrasive CO.

884 East 67th Street Cleveland 8, Ohio
Howell Works Howell, Michigan

The Metal Market

All users of copper and aluminum must notify NPA promptly of their fourth quarter requirements or run risk of not obtaining shipments in that period.

AUTHORIZED controlled material orders will be required of all consumers for the delivery of copper and aluminum, as well as steel, beginning Oct. 1. This revision in CMP regulations, making it mandatory for all users of these metals in the forms listed in Regulation 1, had been forecast as a necessary step. It will help some fabricators, especially those who use comparatively small tonnages in their operations, in obtaining necessary supplies.

If you do not notify NPA of your requirements promptly, you run the risk of finding the major portion of available supplies distributed to those who have indicated their needs in time to make their order effective for fourth quarter delivery.

National Production Authority has instituted also a new program for allocating copper raw materials to brass mills according to the average monthly quantity of materials consumed and shipped by individual producers during a selected base period. Under the procedure, these copper allocations to brass mills will be based on shipments during a 12-month period (January, 1947-July, 1950). Copper allotments will be made monthly.

The same historical basis will be employed in regulating the production at brass mills. NPA plans to issue monthly production directives, instructing individual producers as to the quantities of brass mill products which they will be required to ship in a given month.

Still another order is in the formative stage. It is aimed at maintaining existing relationships between distributors of brass mill products and brass mills. The proposed regulation would authorize distributors of brass mill products to place authorized controlled material orders (within certain restrictions) with brass mills to replace inventories. It is also proposed to establish limitations on the required acceptance of such orders by brass mills.

NPA officials believe the present copper shortage will continue for some time to come as a result of work stoppages in Utah and New Jersey. They indicated, however, that some easing of the refined copper supply situation may become evident during the fourth quarter of this year.

More Copper Scrap Needed

Shortage of scrap continues to hamper operations of brass and bronze ingot producers. The industry's advisory committee has urged NPA to take further steps toward assuring a continued flow of unalloyed copper scrap and copper-base alloy scrap to ingot mills to help them maintain production.

Relief is needed, the committee said, from a government pricing regulation which provides premiums to scrap dealers for certain quantities and types of scrap. The minimum quantity (60,000 pounds) for which dealers are paid the top premium is too high and has created a tendency among many scrap dealers to withhold smaller quantities from the market while trying to accumulate large quantities in order to qualify for the premium price.

To accelerate the flow of scrap to the brass and bronze industry, the committee makes these recommendations: Reduce the top premium quantity to 40,000 pounds and the next lower premium quantity to 20,000 pounds; permit dealers to combine Group 1 and Group 2 scrap in a single shipment to qualify for premium prices; reduce the premium received by dealers for preparing scrap indended for sales to foundries.

Some smelters of scrap also face curtailment of operations if the flow of scrap does not increase.

NPA Zinc Allocations

NPA issued its August allocations of slab zinc which are "in some cases less than permitted use of the metal for July." August supplies of slab zinc are estimated at about 70,000 tons while requests for allocations were more than double that amount.

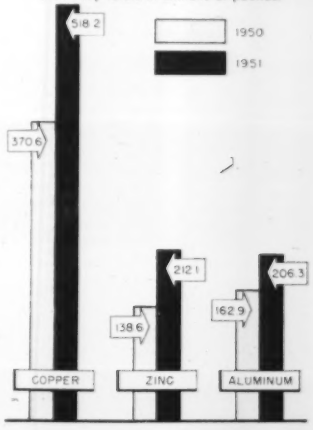
August allocations will be enough to fill all rated orders, but will not be enough to reach the full permitted use for nonrated purposes. Consumers of slab zinc are permitted to use up to 70 or 80 per cent of their average monthly consumption from Jan. 1 to June 30, 1950, depending on the grade.

It will be necessary for users to draw on their inventories to equalize the distribution of the limited available supply. Where consumers have no inventory on hand the August allocation will provide for all rated orders and for some nonrated production.

NONFERROUS CASTINGS

. . . shipments rise on war work

(Jan.-May totals in millions of pounds)



Tin Stocks, Prices Hold

Stocks of tin held by the Reconstruction Finance Corp. hold steady, amounting to 18,105 tons on July 1 compared with 18,618 tons on Jan. 1. It is estimated in unofficial quarters that the agency has transferred about 6000 tons to the national stockpile during the first half of the year. Prices are steady on the basis of $1.03 for Grade A metal.

Takes Aluminum Plant Bids

Alcoa received bids to Aug. 1 for construction of a proposed aluminum plant at Malaga on the Columbia river. No announcement of award has been released. Selected contractors only were invited.

Antimony Stocks Decline

Washington—Domestic mine production of antimony declined 5 per cent in April to 374 tons (content) while smelter production of metal, oxide and sulfide increased 69 per cent to 1213 tons, reports the Bureau of Mines. Consumption of primary antimony during April at 1350 tons was the lowest recorded in 1951 and was 16 per cent lower than in March when it totaled 1613 tons. The month-end producers', dealers' and consumers' stocks for April were the lowest since January, with 6553 short tons of antimony on hand.

Cobalt Consumption Declines

Consumption of cobalt in the United States declined to 2,322,820 pounds in the first quarter. This reversed an upward trend that had persisted for five consecutive quarterly periods. With the exception of high-temperature alloys, high-speed steel and cemented carbides, use of cobalt for all important purposes declined 17 per cent from the all-time record high established in the fourth quarter of 1950. These figures are based on a survey made by the Department of the Interior.

Production of cobalt in the United States gained 8 per cent in the first quarter while imports gained 62 per cent. Production of cobalt oxide dropped 20 per cent while imports declined 57 per cent.

Bethlehem Steel Co., which recovers cobalt as a by-product concentrate from the Cornwall iron ore mine in Pennsylvania, was the only producer in this country of commercial cobalt as ore. Its first quarter output of 115,574 pounds was a 35 per cent drop from the preceding quarter's figure.

Imports of cobalt into the United States were 44 per cent larger in the first quarter.

NONFERROUS METALS

(Cents per pound, carlots, except as otherwise noted)

Primary Metals

Copper: Electrolytic 24.50c, Conn. Valley; Lake 24.62½c, delivered.

Brass Ingots: 85-5-5-5 (No. 115) 29.00c; 88-10-2 (No. 215) 35.50c; 80-10-10 (No. 305) 34.00c; No. 1 Yellow (No. 405) 25.50c.

Zinc: Prime western 17.50c; brass special 17.75c; intermediate 18.00c, East St. Louis; high grade 18.85c, delivered.

Lead: Common 16.80c; chemical 16.90c; corroding 16.90c, St. Louis.

Primary Aluminum: 99% plus, ingots 19.00c, pigs 18.00c. Base prices for 10,000 lb and over. Freight allowed on 500 lb or more but not in excess of rate applicable on 30,000 lb. c.l. orders.

Secondary Aluminum: Piston alloys 20.50c; No. 12 foundry alloy (No. 2 grade) 19.50c; steel deoxidizing grades, notch bars, granulated or shot: Grade 1, 18.00c; grade 2, 17.75c; grade 3, 17.25c; grade 4, 16.50c.

Magnesium: Commercially pure (99.8%) standard ingots, 10,000 lb and over 24.50c, f.o.b. Freeport, Tex.

Tin: Grade A, prompt 103.00.

Antimony: American 99-99.8% and over but not meeting specifications below 42.00c; 99.8% and over (arsenic 0.05% max.; other impurities 0.1% max.) 42.50c; f.o.b. Laredo, Tex., for bulk shipments.

Nickel: Electrolytic cathodes, 99.9%, base sizes at refinery, unpacked, 56.50c; 25-lb pigs, 59.15c; "XX" nickel shot, 60.15c; "F" nickel shot or ingots, for addition to cast iron, 58.50c. Prices include import duty.

Mercury: Open market, spot, large lots, New York $200-$205 per 76-lb flask.

Beryllium-Copper: 3.75-4.25% Be, $1.56 per lb of alloy, f.o.b., Reading, Pa.

Cadmium: "Regular" straight or flat forms, $2.55 del.; special or patented shapes $2.80.

Cobalt: 97.99%, $2.10 per lb for 500 lb (kegs); $2.12 per lb for 100 lb (case); $2.17 per lb under 100 lb.

Gold: U. S. Treasury, $35 per ounce.

Silver: Open market, New York 90.16c per oz.

Platinum: $90-93 per ounce from refineries.

Palladium: $24 per troy ounce.

Iridium: $200 per troy ounce.

Titanium (sponge form): $5 per pound.

Rolled, Drawn, Extruded Products

COPPER AND BRASS

(Base prices, cents per pound, f.o.b. mill; effective May 23, 1951)

Sheet: Copper 40.18; yellow brass 37.28; commercial bronze 95% 40.18, 90% 39.78; red brass, 85% 38.86, 80% 38.47; best quality 38.07; nickel silver, 18% 50.94; phosphor-bronze grade A, 5% 59.42.

Rod: Copper, hot-rolled 36.03; cold-drawn 37.28; yellow brass free cutting 31.70; commercial bronze, 95% 39.87, 90% 39.47; red brass 85% 38.55, 80% 38.16.

Seamless Tubing: Copper 40.22; yellow brass 40.28; commercial bronze, 90% 42.44; red brass, 85% 41.77.

Wire: Yellow brass 37.57; commercial bronze, 95% 40.47, 90% 40.07; red brass, 85% 39.15, 80% 38.76; best quality brass 38.36.

Copper Wire: Bare, soft, f.o.b. eastern mills, c.l. 28.67-30.29c; l.c.l. 29.17-30.92; 100,000 lb lots 28.45-30.29c; weatherproof, f.o.b. eastern mills, c.l. 30.10, l.c.l. 30.18. 100,000 lb lots 29.35c; magnet, del., 15,000 lb or more 34.50, l.c.l. 35.25.

ALUMINUM

(30,000 lb base; freight allowed on 500 lb or more but not in excess of rate applicable on 30,000 lb c.l. orders)

Sheets and Circles: 2S and 3S mill finish c.l.

Thickness Range Inches	Widths or Diameters, In., Inc.	Flat Sheet Base*	Coiled Sheet Base	Coiled Sheet Circle† Base
0.249-0.136	12-48	30.1	....	....
0.135-0.096	12-48	30.6	....	....
0.095-0.077	12-48	31.2	29.1	33.2
0.076-0.061	12-48	31.8	29.3	33.4
0.060-0.048	12-48	32.1	29.5	33.7
0.047-0.038	12-48	32.5	29.8	34.0
0.037-0.030	12-48	32.9	30.2	34.6
0.029-0.024	12-48	33.4	30.5	35.0
0.023-0.019	12-36	34.0	31.1	35.7
0.018-0.017	12-36	34.7	31.7	36.6
0.016-0.015	12-36	35.5	32.4	37.6
0.014	12-24	36.5	33.3	38.9
0.013-0.012	12-24	37.4	34.0	39.7
0.011	12-24	38.4	35.0	41.2
0.010-0.0095	12-24	39.4	36.1	42.7
0.009-0.0085	12-24	40.6	37.2	44.4
0.008-0.0075	12-24	41.9	38.4	46.1
0.007	12-18	43.3	39.7	48.2
0.006	12-18	44.8	41.0	52.8

* Lengths 72 to 180 inches. † Maximum diameter, 26 inches.

Screw Machine Stock: 5000 lb and over.

Dia. (In.) or distance across flats	—Round— R317-T4,	——Hexagonal—— R317-T4	17S-T4
	17S-T4		
0.125	52.0	....	....
0.156-0.188	44.0	....	....
0.219-0.313	41.5	....	....
0.375	40.0	46.0	48.0
0.406	40.0	....	....
0.438	40.0	46.0	48.0
0.469	40.0	....	....
0.500	40.0	46.0	48.0
0.531	40.0	....	....
0.563	40.0	....	45.0
0.594	40.0	....	....
0.625	40.0	43.5	45.0
0.688	40.0	....	45.0
0.750-1.000	39.0	41.0	42.5
1.063	39.0	....	41.0
1.125-1.500	37.5	39.5	41.0
1.563	37.0	....	....
1.625	36.5	....	39.5
1.688-2.000	36.5	....	....

LEAD

(Prices to jobbers, f.o.b. Buffalo, Cleveland, Pittsburgh) Sheets: Full rolls, 140 sq ft or more $22.00 per cwt; add 100 cwt 10 sq ft to 140 sq ft. Pipe: Full coils $22.00 per cwt. Traps and bends: List prices plus 60%.

ZINC

Ribbon zinc in coils, 23.00c, f.o.b. mill, 36,000 lb and over. Plates, not over 12-in., 23.50-24.50c; over 12-in., 23.50-24.50c.

"A" NICKEL

(Base prices f.o.b. mill)

Sheets, cold-rolled, 77.00c. Strip, cold-rolled, 83.00c. Rods and shapes, 73.00c. Plates, 75.00c. Seamless tubes, 106.00c.

MONEL

(Base prices, f.o.b. mill)

Sheets, cold-rolled 60.50c. Strip, cold-rolled 63.50c. Rods and shapes, 58.50c. Plates, 59.50c. Seamless tubes, 93.50c. Shot and blocks, 53.50c.

MAGNESIUM

Extruded Rounds, 12 in. long, 1.31 in. in diameter, less than 25 lb, 55.00-62.00c; 25 to 99 lb, 45.00-52.00c; 100 lb to 5000 lb, 41.00c.

TITANIUM

(Prices per lb, 10,000 lb and over, f.o.b. mill) Sheets, $15; sheared mill plate, $12; strip, $15; wire, $10; forgings, $6; hot-rolled and forged bars, $6.

Plating Materials

Chromic Acid: 99.9% flakes, f.o.b. Philadelphia, carloads 27.00c; 5 tons and over 27.50c; 1 to 5 tons, 28.00c; less than 1 ton 28.50c.

Copper Anodes: Base 2000 to 5000 lb; f.o.b. shipping point, freight allowed: Flat untrimmed 37.62c; oval 37.19c. Cast 37.375c, delivered in eastern territory.

Nickel Anodes: Rolled oval, carbonized, carloads, 68.50c; 10,000 to 30,000 lb, 69.5[illegible]c; 3000 to 10,000 lb, 70.50c, 500 to 3000 lb 71.50c; 100 to 500 lb, 73.50c; under 100 lb, 76.50c; f.o.b. Cleveland.

Nickel Chloride: 100-lb kegs, 35.00c; 400-lb bbl, 33.00c; up to 10,000 lb, 32.50c; over 10,000 lb, f.o.b. Cleveland, freight allowed on barrels, or 4 or more kegs.

Sodium Stannate: 25 lb cans only, less than 100 lb, to consumers 47.7c; 100 or 250 lb drums only, 100 to 400 lb, 43.1c; 500 to 1900 lb, 40.6c; 2000 to 9000 lb, 38.9c. Freight allowed east of Mississippi and north of Ohio and Potomac rivers.

Tin Anodes: Flat, 1000 lb and over, $1.19; 500 to 999 lb $1.195; 200 to 499 lb, $1.20; less than 200 lb, $1.215. Freight allowed east of Mississippi and north of Ohio and Potomac rivers.

Zinc Cyanide: 100 lb drums, less than 10 drums 47.7c; 10 or more drums, 45.7c, f.o.b. Niagara Falls, N. Y.

Stannous Sulphate: 100 lb kegs of 100 lb bbl, less than 2000 lb $1.0000; more than 2000 lb, 95.00c. Freight allowed east of Mississippi and north of Ohio and Potomac rivers.

Stannous Chloride (Anhydrous): In 100 lb bbl $7.25c; 100 lb kegs $8.23c. Freight allowed.

Scrap Metals

Brass Mill Allowances

Ceiling prices in cents per pound for less than 20,000 lb, f.o.b. shipping point, effective June 26, 1951.

	Clean Heavy	Rod Ends	Clean Turnings
Copper	21.50	21.50	20.75
Yellow Brass	19.125	18.875	17.875
Commercial Bronze			
95%	20.50	20.25	19.75
90%	20.50	20.25	19.75
Red Brass			
85%	20.25	20.00	19.375
80%	20.125	19.875	19.375
Muntz metal	18.125	17.875	17.375
Nickel silver, 10%	21.50	21.25	10.75
Phos. bronze, A	27.00	26.75	25.75

Copper Scrap Ceiling Prices

(Base prices, cents per pound, less than 40,000 lb f.o.b. point of shipment)

Group I: No. 1 copper 19.25; No. 2 copper wire and mixed heavy 17.75; light copper 16.50; No. 1 borings 19.25; No. 2 borings 17.75; refinery brass, 17.00 per lb of dry Cu content for 50 to 60 per cent material and 17.25 per lb for over 60 per cent material.

Group II: No. 1 soft red brass solids 19.50; No. 1 composition borings 19.25 per lb of Cu content plus 83 cents per lb of tin content; mixed brass borings 19.25 per pound of Cu content plus 78 cents per lb of tin content; unlined red car boxes 19.25; lined red car boxes 18.25; cocks and faucets 16.75; mixed brass screens 16.00; zinc bronze solids and borings 16.25.

Zinc Scrap Ceiling Prices

(Cents per pound, f.o.b. point of shipment)

Unsweated zinc dross, 12.25c; new clippings and trimmings, 14.50; engravers' and lithographers' plates, 14.50c; die-cast slabs, min. 90% zinc, 12.25; old zinc scrap, 11.25c; forming and stamping dies, 11.25; new die cast scrap, 10.75, old zinc die cast radiator grills, 10.50; old die cast scrap, 9.50c.

Lead Scrap Ceiling Prices

(F.o.b. point of shipment)

Battery lead plates, 17.00c per lb of lead and antimony content, less smelting charge of 2 cents per lb of material in lots 15,000 lb or more; less 2.25c in lots less than 15,000 lb. Used storage batteries (in boxes) drained of liquid: 6.60c for 15,000 lb or more; 6.40c for less than 15,000 lb. Soft lead scrap, hard lead scrap, battery slugs, cable lead scrap or lead content of lead-covered cable scrap, 15.25c per lb. In addition, brokerage commissions are permitted.

Aluminum Scrap Ceiling Prices

(Cents per pound, f.o.b. point of shipment, less than 5000 lb)

Segregated plant scrap: 2s solids, copper free, 10.50; high grade borings and turnings, 8.50; No. 12 piston borings and turnings, 7.50; Mixed plant scrap: Copper-free solids, 10.00 dural type, 9.00; Obsolete scrap: Pure old cable, 10.00; sheet and sheet utensils, 7.25; old castings and forgings, 7.75; clean pistons, free of struts, 7.75; pistons with struts, 5.75.

DAILY PRICE RECORD

1951	Copper	Lead	Zinc	Tin	Aluminum	Antimony	Nickel	Silver
July 1-5	24.50	16.80	17.50	106.00	19.00	42.00	56.50	90.16
July 2-31	24.50	16.80	17.50	106.00	19.00	42.00	56.50	90.16
June 28-30	24.50	16.80	17.50	106.00	19.00	42.00	56.50	90.16
June 18-27	24.50	16.80	17.50	106.00	19.00	42.00	56.50	87.75
June 15-16	24.50	16.80	17.50	111.00	19.00	42.00	56.50	87.75
June 14	24.50	16.80	17.50	118.00	19.00	42.00	56.50	87.75
June 13	24.50	16.80	17.50	123.00	19.00	42.00	56.60	87.75
June 8-12	24.50	16.80	17.50	129.00	19.00	42.00	56.50	87.75
July-Avg.	24.50	16.80	17.50	106.00	19.00	42.00	56.50	90.16
June Avg.	24.50	16.80	17.50	117.962	19.00	42.00	56.50	88.4[illegible]2
May Avg.	24.50	16.80	17.50	139.923	19.00	42.00	56.50	90.16
Apr. Avg.	24.50	16.80	17.50	145.735	19.00	42.00	56.50	90.16

NOTE: Copper: Electrolytic, del. Conn. Valley; Lead, common grade, del. St. Louis; Zinc: prime western, E. St. Louis; Tin, Straits, del. New York; Aluminum primary ingots, 99%, del; Antimony, bulk, f.o.b. Laredo, Tex.; Nickel, electrolytic cathodes, 99.9%, base sizes at refinery unpacked. Silver, open market, New York. Prices, cents per pound; except silver, cents per ounce.

Reinforcing Bars . . .

Reinforcing Bar Prices, Page 141

Cleveland—Substantial number of small building jobs is pending in this area but no action with respect to placing steel for them is expected before fourth quarter. Reinforcing bar supplies are not likely to materially improve over coming months. A seasonal slackening in demand is likelihood will not be as noticeable this winter as in normal times.

Los Angeles—With 90 per cent district building projects outside the umbrella, industry observers fear harm to small fabricators unless CMP regulations affecting construction are clarified. With CMP ratings not required for fabricators' quarterly bar requirements under 2,000 tons, suppliers of plain and deformed reinforcing bars say mills can accept only 50 per cent of total reinforcing bar needs.

Sheets, Strip . . .

Sheet and Strip Prices, Page 141 & 142

Cleveland—Booked-up condition of the mills for months ahead precludes any easing in flat-rolled steel supply conditions soon despite slackening activity in the automotive industry. Over-allotment of tonnage on CMP tickets has been so heavy there is certain to be substantial carryover of validated tonnage from month-to-month through remainder of the year. Expectations are the open-end of CMP will be closed for fourth quarter bringing all consumption under ratings. This will mean there will be practically no "free" tonnage except for possibly material that can be picked up in the "gray" market.

New York—Until there is a further stepping up in the percentage of set-asides for fourth quarter on rated work, or some other measure is taken, many orders for sheets will continue to be turned away by the mills. Producers generally are booked up for remainder of the year on all major grades.

Philadelphia—With the vacation season on the wane, stamping shops are pressing harder for sheets. Moreover, some consumer lines that have been lagging for weeks have shown greater spark, including televisions and radios. Some have been fortunate in getting fairly adequate tonnage on mill books for fourth quarter, but generally they are seeking more tonnage than they can place.

Pittsburgh—NPA promises more precise matching of fourth quarter allotments and producing potential but third carryovers will be large enough to affect fourth quarter deliveries seriously with resulting carryover into first quarter 1952. These carryovers will include validated orders. NPA is spot-checking to determine if customer requirements have been over-estimated.

Cincinnati—Order books of district sheet mills are clogged with enough tonnage to cover capacity through fourth quarter. Schedules, however, are being made month-by-month, and the situation will not be cleared until the CMP confusion is ended. Mill interests foresee no way of avoiding a heavy third quarter carryover.

Chicago—Sheetmakers report some light cancellation of orders for electrical sheets from manufacturers of small electric motors for household appliances. This is regarded as an indication either of substantial motor inventories or production limited by copper shortage. This is the only area in the sheet picture in which NPA overallocation of CMP tickets gives signs of coming into better

Birmingham—Fairfield sheet mill of Tennessee Coal, Iron & Railroad has returned to production last week after a three day shut down. Company spokesmen said a few workers declined to follow supervisory instructions and set up a picket line. The plant was immediately closed.

St. Louis—Cold-rolled sheet shortage is worsened by flood relief allotments to warehouses. This will come out of former free market tonnage. Set-aside capacity of the mills is already filled through fourth quarter and more certified orders are being proferred. None has been accepted for some weeks. Sheet deliveries average six weeks behind schedule.

Steel Bars . . .

Bar Prices, Page 141

Chicago—Barmakers are under considerable pressure from regular customers who were squeezed out of September and fourth quarter schedules when mills were required to book CMP certifications on a first-come first-serve basis. No such situation looms for manufacturers of consumer durable goods who come under CMP starting fourth quarter. Indication is their requests will be confined to the free steel percentage and mills will be able to accommodate regular accounts first.

Philadelphia—Cold bar drawers may be given permission by Washington to secure larger allotments of hot stock, based on mill receipts during the first six months of this year. This may come as one phase of the adjustments in hot mill schedules attending the application of CMP to all consumers in fourth quarter. Hot bar producers currently are booked up to the limit of their rated quotas, and in most instances beyond.

Pittsburgh—Fourth quarter books are filled. Over-allocation will result in heavy carryovers from now on. Closed-end CMP, believed inevitable in fourth quarter, will not affect the carryover. Converters of hot-rolled bars to cold-finished are swamped with orders. Alloy barmakers cannot reconcile melt schedules, alloy supplies and heavy demand with 85 per cent hot-rolled alloy and 75 per cent cold-finished alloy bars going the defense route.

Cleveland—Barmakers are virtually booked to capacity through fourth quarter. What little space remains unfilled is being held in reserve for possible government directives. Meanwhile, the mills are overwhelmed with CMP allotment tickets some of which cannot possibly be honored for the prescribed period. There will be substantial carryover from third to fourth quarter of validated tonnage as things now stand.

Seattle—Merchant bar demand is fairly active but the mills are not seeking new orders, especially tonnage requiring quick deliveries. Rolling mill schedules now carry into first quarter, bulk of production being reinforcing material. CMP regulations are confusing. Some capacity is reserved for emergency public works.

More Hot Bar Tonnage Sought

Washington—Cold-finished Carbon & Alloy Bar Industry Advisory Committee at an organization meeting last week asked NPA to provide more steel for the industry so cold-finished bar producers can meet their obligations in support of the defense program.

Committee members said the 33 companies in the industry are finding it difficult to obtain sufficient hot-rolled bar steel to meet required shipments to warehouses and other customers.

NPA officials said an effort will be made to increase the steel supply to the industry by issuing directives on steel mills, possibly in time to affect steel mill production in October.

Discussing operation of CMP with the committee, NPA officials pointed out allotments are made under CMP on the basis of tonnage for each claimant group. These allotments cannot be broken down by product (plate, bar, structural, sheet) as suggested because of the thousands of classifications in which both carbon and alloy steels would fall.

The committee urged some procedure be used whereby steel can be conserved by eliminating a few sizes of flat-rolled bars, as was done in World War II. It was suggested that warehouses, which handle a large portion of cold-finished bar products, could help in standardizing flat-rolled bar sizes.

Committee members also told NPA there is some confusion over what to do in connection with the revalidation of third quarter CMP tickets which cannot be filled in that quarter. NPA explained that these tickets must be revalidated within the advance allotment for the fourth quarter, as permitted under CMP, to take care of such contingencies.

Impact of military and industrial expansion programs will be heavy in fourth quarter, NPA officials said, and this will affect all products, including cold-finished bars.

The cold-finished bar industry serves from 6000 to 10,000 users, and the bars are manufactured into more than 100,000 products, ranging from screws and bolts to steel shafts and flat beds for heavy machinery.

Wire . . .

Wire Prices, Page 143

Chicago—So urgent is the need for coated nails for building purposes, distributors in this area are paying full freight on such supplies as they can obtain from Pittsburgh and Duluth producers. Also in short supply are field fence, steel posts and barbed wire. No letup in demand is foreseen. Some quantities of nails offered distributors in the Missouri-Kansas flood areas have been turned down because of sizable inventories already on hand.

Cleveland—Requirements for flood-

rehabilitation work in the Kansas-Missouri area are putting an added burden on the over-loaded wire mills. Expectations are delays in making shipments on regular account may be necessitated by the flood tonnage, at least in certain products. Indications are the wire mills will enter fourth quarter with substantial carryover tonnage.

Plates . . .

Plate Prices, Page 141

Philadelphia — All eastern plate mills are booked up solidly for remainder of the year and are turning away substantial rated tonnage. Mill quotas on rated work are around 95 per cent and in most cases surplus bookings and arrearages are expected to eat up the remainder. Effects of bringing in all consumers under CMP, as now officially confirmed, remain to be seen. Demand for plates for pressure vessels is particularly strong and while practically if not all of this tonnage is rated an increasing amount is having to be turned back.

Pittsburgh — Plate supply is unimproved. Directives keep mill scheduling in constant confusion. Fourth quarter is completely filled with greatest demand for light plates. Most producers hold validated orders in excess of producing potential.

Los Angeles — Kaiser Steel Corp. filled fourth quarter plate books from a deluge of CMP certified tickets.

Seattle—Despite continued shortage of plates, fabricators are maintaining operations at fairly high level. Several classified jobs, involving tanks, are pending. Bonneville Power Administration takes bids Aug. 16 for 150 tons of ¾-in. sheet steel piling.

Structural Shapes . . .

Structural Shape Prices, Page 141

Pittsburgh — Over-validated structural production for August and September will be further complicated with requests that tonnage be sent the mid-western flood area for reconstruction purposes. Basis for rating expansion programs will be extent of completion, type of facility being built, equity and hardship. Projects here have been delayed to some extent because of structural supply. Producers are turning away rated orders in view of their present over-booked position.

Philadelphia — Apart from public bridge work, structural inquiry is quiet and orders spotty. Some of this lull is ascribed to the need for interpretation of latest government regulations affecting building and to general uncertainty as to costs of labor and materials by the time work can go ahead. One phase of the latest regulations amounts to a prohibition against starting most new construction until Oct. 1, except where only a small amount of critical material is required.

San Francisco — Twenty-two area fabricating plants have been closed down since Aug. 3 by a strike called by the local of the AFL International Association of Bridge, Structural & Ornamental Iron Workers. Agreement was reached with employers on a 10 per cent wage boost but the union wants the increase to be made retroactive to July 1. The new scale is $1.895 an hour for journeymen. About 1000 ironworkers are involved and Army and Navy contracts calling for more than $50 million in steel fabrication have been tied up. Two erection locals of the union joined the walkout by refusing to work on any job where steel from the struck firms is used.

Seattle—Small structural inquiries are numerous and a number of large projects pend for Alaska. Largest fabricator in the area has taken no sizable job for more than a month, having a backlog extending over remainder of the year. Business for earlier than mid-1952 delivery is not being solicited.

Tubular Goods . . .

Tubular Goods Prices, Page 145

Los Angeles — Widening gap between California oil well drilling industry quarterly pipe and casing consumption of 36,000 tons and Petroleum Administration for Defense quarterly pipe allocations of 20,000 tons is causing tubular goods stocks of oil well suppliers and drillers to sink rapidly.

Seattle — Cast iron pipe deliveries extend as much as 180 days. This situation is a severe handicap to sellers, considerable business going to other types of pipe on which quicker shipment is promised.

Scrap . . .

Scrap Prices, Page 148

Pittsburgh — Scrap has moved at somewhat faster pace over the past three weeks but a slowdown is expected in mid-August. Recent quickening was due to advertising efforts of the Scrap Salvage Committee and the alertness of scrap-conscious salesmen. Upgrading continues and although slightly more scrap is available there have been limited complaints from purchasers about the upgrading. Allocation in scrap-producing areas surrounding Pittsburgh is felt here. Mills rely on outside shipments which are hampered by carmarking.

New York — Slight betterment is noted in movement of steel scrap. This is ascribed partly to the increased volume of industrial scrap coming out now that many metalworking plants have concluded their vacation periods. There also is a little better flow of yard scrap. However, scarcity of the steel grades continues acute, with consumers unable to do little more than hold their own in point of inventories. Cast grades are in better supply than steel grades, although there is little surplus.

Buffalo — Sustained improvement in the flow of scrap has enabled mills to add to reserve stocks here. Better movement of scrap is reported via water and also from surrounding territory. Substantial allocations are reported to replenish low stockpiles. Mills yard stocks showed sizable gains during recent weeks. Approximately 9000 tons more arrived by water.

Philadelphia — Shortage of steel scrap remains acute. One local mill has less than five days supply on hand. Others at least temporarily appear in somewhat better shape, and in general the flow of tonnage is slightly better than a month ago with indications of further improvement as fall nears. However, no material easing is in prospect.

Cleveland — Stocks of scrap at open-hearth furnaces continue low, although this is not reflected in operations which have been maintained at 100 per cent of capacity or higher for many weeks. The shortage threatens future operations, however, since no reserve can be accumulated for use when shipments become delayed by inclement weather or transportation difficulties. Substantial allocations of scrap to mills in the Ohio district were made by authorities in Washington last week which may alleviate the situation.

Vacations and other seasonal factors are expected to slow down the flow of industrial scrap through August. At the same time, these same factors have lowered somewhat the requirements of foundries, resulting in a slight improvement in their stock position. The special scrap gathering programs here, including the scrapping of abandoned street railway lines and the collection campaign sponsored by the Chamber of Commerce, are progressing satisfactorily.

Cincinnati — The hand-to-mouth supply situation, with growing dependence on allocations, continues as mills face frustration in trying to build scrap stocks. Brokers and dealers encounter no easing in supplies, with the exception of the poorer grades of cast. Good cast is scarce, demand pressing.

Detroit — Chrysler Corp. last week reported 3 million more pounds of scrap metal were recovered in the last two weeks as result of its intensified scrap drive. During the first month of the drive the company found 1,200,000 pounds of extra scrap metal and during the last two weeks, 3,050,000 pounds more, a total so far of 4,250,000 pounds.

The drive is in addition to Chrysler's regular scrap activities which result in the reclaiming for the market of 35,000 tons monthly. In its intensified effort the company re-examines all tools and dies stored for service work in its own plants and those of suppliers.

Chicago — Inventory-wise the scrap situation in this area is spotty. Some steel plants recently just barely holding their own now report that deliveries are improving and some gain being made. Others are depleting stocks. Overall, the supply of steelmaking grades is estimated at between one and two weeks. Despite the improvement grave doubt exists that any sizable inventory building is possible to avoid shortages next winter. Sustained over-capacity steelmaking operations rule out substantial gain in such a short period. Cast grades remain easy. Good flow of this material, fair stocks and foundry vacation closings are responsible.

St. Louis — Scrap movement is hampered by post flood conditions and preoccupation of farmers with field work. Some mills are down to two weeks supply. None hold over

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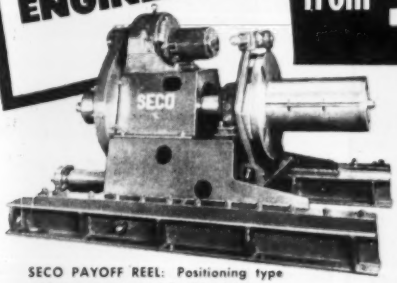

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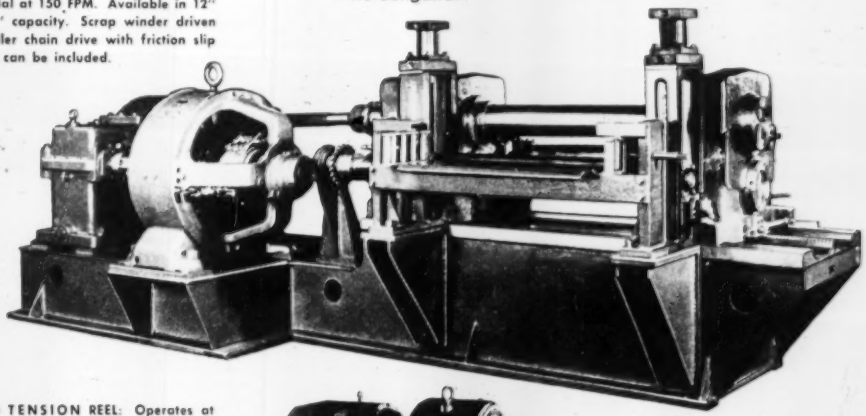
SECO PAYOFF REEL: Positioning type with motor operated feed-in drive. Capacity — 5,000 to 25,000 pound coils, 30" wide. Can also be built for coils up to 72" wide. Coil lifts also available.

SECO SLITTER: 48" heavy-duty type. Handles coils weighing from 12,000 to 15,000 pounds. Makes 6 cuts in 3/16" material at 150 FPM. Available in 12" to 60" capacity. Scrap winder driven by roller chain drive with friction slip clutch can be included.



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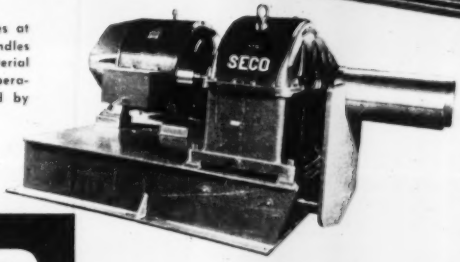

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30 days. Increasing allocations have made free scrap all but a thing of the past. Local organizations have been formed to step up the scrapping of autos. However, they are hampered by scarcity of labor and reluctance of dealers to scrap parts that may later be in demand as replacements. Foundries have ample stocks of cast scrap.

Los Angeles Goal of San Bernardino Riverside County Scrap Mobilization Committee, formed under chairmanship of Earl S. Reynolds, director of public relations, Fontana plant, Kaiser Steel Corp., is to collect 2000 tons of heavy scrap daily.

San Francisco The struggle to obtain scrap steel goes on. With mills continuing to operate above 100 per cent theoretical capacity, the strain on the scrap supply is aggravated.

Seattle — Favorable weather is stimulating scrap collections but consumption is so heavy inventories are not rising. Bids have been asked for two Maritime Commission ships. Lewiston, Idaho, will open tenders Aug. 20 for 200 tons from the old Clearwater bridge. Japanese mills are seeking material in India. American buyers are scouring Alaska and the Pacific islands for supplies.

Tungsten Ore . . .

New York Press advices from La Paz, Bolivia, are to the effect President Hugo Ballivian of the military government junta has announced production of Bolivian tungsten is to be increased greatly to meet United States defense needs.

Iron Ore . . .

Iron Ore Prices, Page 147

Cleveland Lake Superior iron ore shipments to Aug. 6 showed an increase of 31.5 per cent over the total for the like period a year ago. Movement for the season aggregates 17,818,490 tons compared with 36,365,278 tons for the like 1950 period, with shipments from United States ports alone showing a gain of 11,230,554 tons. July shipments totaled 13,574,174 tons, an increase of 6.85 per cent over the July, 1950, total.

Shipments for the season to Aug. 6 compared with those for the like period a year ago were reported by the Lake Superior Iron Ore Association as follows:

	To Aug. 6—	
	1951	1950
U. S. Ports		
Escanaba	3,606,375	2,540,360
Marquette	2,119,672	2,113,492
Ashland	1,357,727	2,094,841
Superior	17,337,656	11,624,931
Duluth	11,398,784	8,598,374
Two Harbors	10,612,560	8,230,342
Total, U. S.	46,732,974	35,562,420
Canadian Ports		
Michipicoten	128,294	339,858
Port Arthur	687,225	523,020
Total, Canada	1,115,516	862,858
Grand Total	47,848,490	36,365,278

Steep Rock Shipments Gain

Steep Rock Lake, Ont. By the end of July shipments of high grade iron ore from Steep Rock Iron Mines Ltd. had reached 673,439 tons for the 1951 season, compared with 506,443 tons for the like period a year ago. Steep Rock is the newest producing iron ore range on the continent. Only one mine has been brought into production, but ten additional mines are expected to be in production within the next three years. Most of the projected mines will be larger than the one now operating.

Pig Iron . . .

Pig Iron Prices, Page 146

New York Notwithstanding vacation suspensions, demand for foundry iron in this district substantially exceeds supply. Were it not for the relatively freer supply of cast scrap foundries in operation would have difficulty maintaining production. Meanwhile, order backlogs are mounting with gray iron shops feeling the effects of accelerated machine tool building.

Buffalo Tightness grips the merchant pig iron market as even foundries down for vacations continue to accept shipments. Tension may increase shortly when output dips with the shutting down of a furnace for repairs. At least 75 per cent of current output is going into ingot production. Shipments continue to Michigan motor casters. Government work shows further expansion.

Philadelphia One district steel mill is so short of pig iron that unless it gets immediate relief it will have to curtail operations. One difficulty is delay in the shipment of foreign iron under contract. Other mills, and foundries as well, report it is touch and go with them. Oven coke is in fair supply.

Pittsburgh Little relief is expected in the tight pig iron market here. Summer slowdown because of vacations contributes little to ease supply situation in view of increased iron ratios in furnace melts to compensate for scrap lack. Low phos and intermediate low-phos are in slightly smaller supply than basic, bessemer and No. 2 foundry. Fourth quarter supplies for foundries and steel plants are the major concern. As 20 per cent minimum is set for defense and related effort, the lone merchant producer in this district is swamped with inquiries.

U. S. Steel's No. 3 blast furnace at its Clairton steelworks is currently out of production for repairs. This stack has annual capacity of 81,000 net tons of iron.

Cleveland Slight easing in pressure from some foundries for pig iron has been evident throughout the summer, largely reflecting shutdowns for vacations. However, with the vacation season on the wane expectations are a surge in demand will be experienced. Iron sellers anticipate steady increase in demand pressure from makers of machine tool castings. Iron production in this immediate district is being pushed at capacity pace, all nine blast furnaces actively producing. One stack is scheduled to go out of blast for repairs next month.

Chicago Despite the fact that closing of foundries this summer for vacation periods has reduced consumption pig iron demand falls short of supply. Thus an even tighter situation is anticipated for this fall. Forty of the district's 42 blast furnaces are operating currently.

St. Louis Summer slackening of

demand for castings has slowed foundry pressure for pig iron. Ample supplies of cast scrap have enabled many shops to use less pig iron in their melts. Overall, however, pig demand is heavy and steady. Local furnaces have shifted to a larger percentage of steelmaking iron. Most consumers here are comfortably supplied although business outside normal territory cannot be accepted.

Cincinnati—Furnace interests are under less pressure for pig iron. This is attributed to failure of the melt to react from a lower level in July. This district will likely face less shifting in castings demand than some others.

San Francisco—Pig iron is being imported from India, Africa, Chile, yet there is not nearly enough to keep the steel mills and foundries supplied.

Rails, Cars . . .

Track Material Prices, Page 143

New York—July production of domestic freight cars amounted to 5290 units, against 9644 the preceding month, says the American Railway Car Institute and Association of American Railways in a joint statement. This substantial drop resulted from strikes in seven plants of four different car builders, plus floods which affected production in the Middle West. July orders amounted to 2417 cars and established backlogs on Aug. 1 at 144,810.

Birmingham, Ala.—Gulf, Mobile & Ohio railroad placed an order with the Bessemer plant of Pullman Standard Car Mfg. Co. for 250 hopper cars for transport of ore from new facilities at Mobile to the Birmingham district.

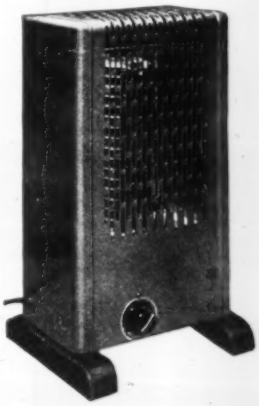
Warehouse . . .

Warehouse Prices, Page 147

Cleveland—Local warehouse operators expect to receive their full allotments of steel from the mills in fourth quarter, but the fact there will be little, if any, "free" tonnage available will mean their total intake will likely fall under that of a year ago. Some distributors' stocks are in better balance than others, but, overall, the inventory position leaves much to be desired. Demand currently is less pressing than earlier in the summer but the warehouses could do larger volume business were their stocks equal to all the demand coming out.

Buffalo—Tonnage allocated under CMP is not sufficient for warehouses to meet customers' demands. Many inconveniences also are reported among customers as warehouse stocks are low and curtailed receipts often are not wanted sizes. This is especially true in alloys and stainless items. Little free steel is reported available for warehouses to add to allocated tonnage.

Pittsburgh—Distributors' receipts are slightly improved but NPA ruling increasing up to 130 per cent, base period receipts of certain products to distributors in mid-Western flood area will curtail August and September warehouse tonnage here. Major complaint of distibutors is that base period is not representative.



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1876 — Seventy-Fifth Anniversary — 1951

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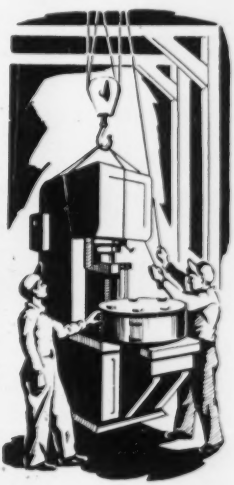

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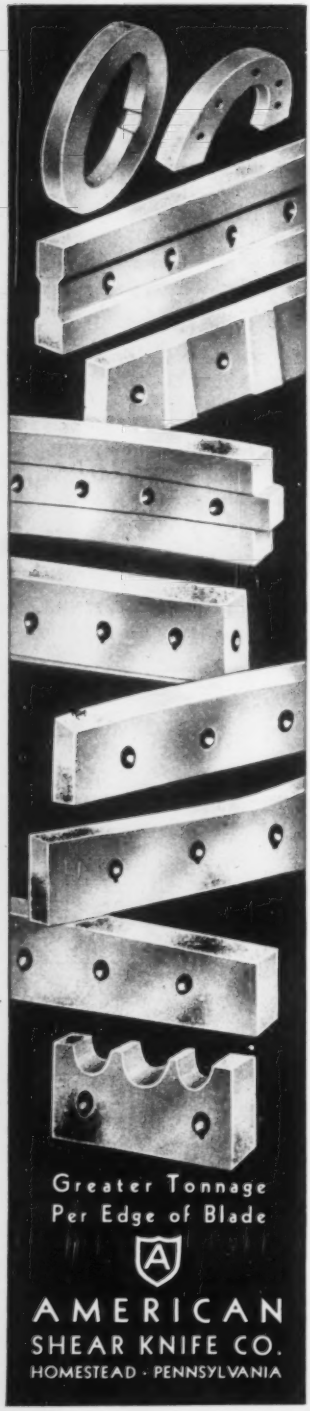
Feel free to consult our Engineering Department at any time for specific recommendations. A. LESCHEN & SONS ROPE CO., 5909 Kennerly Ave., St. Louis, Missouri. Warehouses and branch offices in all principal cities.



Warehousemen report heavy demand pressure for all products with bars, all types, and flat-rolled in extremely short supply.

Philadelphia — Demand on warehouses continues well in excess of what they can handle. Particularly pressing at the moment is inquiry for plates and bars, although that for small shapes and sheets is not far behind. Fewer metalworking shops are now on vacation and that is one factor. Another, and more important, is the oversold condition of the mills.

Birmingham—Organization of the Mutual Steel Co. here was announced last week by M. R. Fox, president, and P. T. Oxford, Jr., vice president. The company, with plant at 4007 Seventh Court, north, will do a general fabricating business.

Cincinnati—Normal mill customers are avid for warehouse aid but get little satisfaction. Sales volume last month was fair, supported almost wholly by current receipts, as stocks are near depletion.

St. Louis—Warehouse steel stocks are low, especially plates and stainless. Aircraft strip is in fair supply. Galvanized items are expected to remain short the rest of the year. Washington gave St. Louis warehouses a 30 per cent flood relief increase in tonnage, but they have not received mill assurances of delivery. For that matter they do not know yet what tonnage will be needed. It is indicated structurals will be in greatest demand.

Los Angeles—Mills are generally keeping current on delivery promises to distributors. Restricted to a few products, late deliveries do not exceed 30 to 60 days, and only 10 to 12 per cent of mill tonnage to warehouses is affected.

Seattle—Demand on the warehouses is insistent but distributors lack the stocks to care for all the inquiry coming to them. Reports are heard of stock lists from as far distant as Cleveland circulating here. Buyers are uninterested because of the prohibitive freight involved.

Plans Titanium Research

Washington — Army awarded two contracts to the Research Division, New York University College of Engineering, to cover projects on titanium. One involves studies of the beta-to-alpha transformation in the quench hardening of titanium-manganese alloys. The other will investigate titanium-rich ternary diagrams with the alloying of carbon-oxygen, carbon-nitrogen, and oxygen-nitrogen.

Work will be under the direction of John P. Nielsen, associate professor of metal science, department of chemical engineering.

Consolidated Mining Expands

Consolidated Mining & Smelting Co. of Canada Ltd., Montreal, has a $63 million expansion program under way at its properties in British Columbia. Marwell Construction Co. Ltd., Vancouver, B. C., was awarded the contract to erect a 500-ton concentrator, a crushing plant, hoisting houses, living quarters and other structures at the Bluebell mine. Northern Construction Co. and J. W. Stewart Ltd., Vancouver, have the contract for dam and power plant.

Metallurgical Coke . . .

Metallurgical Coke Prices, Page 145

Buffalo—The new battery of 36 coke ovens at the Donner-Hanna Coke Corp. plant here is nearing completion. The ovens will boost coke output 10 per cent.

Canada . . .

Toronto—The Steel Co. of Canada established a production record for the three-month period ended June 30. Ingot output was larger than in any previous quarter, according to H. G. Hilton, president, who added heavy demand for steel continues.

The Perennial Project . . .

Vote of the House Public Works Committee to kill the St. Lawrence seaway and power project for this session of Congress marked the first time that the undertaking (in the 17 years it's been before Congress) was killed in committee. The project authorization, in the form of a treaty, was first knocked down in the Senate in 1934. In 1944, it was attached to a rivers and harbors bill in the form of a rider and lost. Again the Senate killed the project in 1948 and returned it to the Foreign Relations Committee where it was pigeonholed.

STRUCTURAL SHAPES . . .

STRUCTURAL STEEL PLACED

1620 tons, bearing H piles, substructure, Meridian street bridge, Boston-Chelsea, Mass.; also 650 tons, steel sheet piling, to Bethlehem Steel Co.; Merritt-Chapman & Scott Corp., Boston, general contractor.

400 tons, power plant, Anchorage, Alaska, to Pacific Car & Foundry Co., Seattle; Morrison-Knudsen Co., Seattle, general contractor.

270 tons, trash racks for Seattle's Ross dam project, to Puget Sound Sheet Metal Works, Seattle.

265 tons, research laboratory, R. J. Reynolds Tobacco Co., Winston-Salem, N. C., to Bethlehem Steel Co.; J. A. Jones Construction Co., Charlotte, N. C., general contractor; 75 tons, reinforcing, to Virginia Steel Co., Richmond, Va.

100 tons or more, bridge, Morehead City-Atlantic Beach, N. C., to Virginia Bridge Co., Roanoke, Va.; T. A. Loving & Co., Goldsboro, N. C.; Virginia Steel Co., Richmond, Va., reinforcing steel.

100 tons or more, hospital, Columbia, Tenn., to MacMurray Steel Co., Nashville, Tenn.; Daniel Construction Co., Greenville, S. C., general contractor; Connors Steel Co., Birmingham, reinforcing steel.

100 tons, Rock Island dam enlargement, Washington state, to Pacific Car & Foundry Co., Seattle.

STRUCTURAL STEEL PENDING

865 tons, state bridges, Union county, New Jersey; bids to be opened by the state highway department at Trenton, N. J., Aug. 21.

100 tons, including steel piling, bridge on Sitka highway, Alaska; bids to Bureau of Public Roads, Juneau, Alaska, Aug. 21.

Unstated, steel frame radiometallurgy laboratory, etc., also 15-ton bridge crane; bids to General Electric Co., Richland, Wash., Sept. 5.

Unstated, 300-foot conveyor bridge and coal

handling facilities, Fairbanks, Alaska; bids to Alaska Public Works, Juneau, Sept. 6.

Unstated, Big Cliff dam and completion Detroit dam powerhouse, Oregon state, to Consolidated Builders, on negotiated general contract, $7,252,947 by U. S. Engineer, Portland, Oreg.; bids opened July 7 were rejected.

Unstated, outside facilities Elelson air field, Alaska; Lytle-Green Construction Co. and S. Birch & Sons, Seattle, awarded general contract on joint low bid, $6,020,410.

Unstated, outside facilities, Ladd air field, Alaska; Peter Kiewit Sons Co., Seattle, low $8,493,313.

REINFORCING BARS . . .

REINFORCING BARS PLACED

600 tons, factory, Solar Aircraft Co., Des Moines, Iowa, to Laclede Steel Co., St. Louis.

509 tons, including 556 tons bars, 16 tons steel joists and 27 tons mesh, Parkview Memorial hospital, Ft. Wayne, Ind., to Bethlehem Steel Co., Bethlehem, Pa.; Hagerman Construction Co., Ft. Wayne, Ind., contractor.

185 tons, substructure, Meridian street bridge, Boston-Chelsea, Mass., to Bethlehem Steel Co.; Merritt-Chapman & Scott Corp., Boston, general contractor.

150 tons, high school, Gary, Ind., to United States Steel Supply Co., Chicago.

122 tons, warehouse, U. S. Rubber Co., Michawaka, Ind., to United States Steel Supply Co., Chicago.

100 tons, three 3-span WF beam bridges, Montgomery, Vt., to Vermont Structural Steel Co., Burlington, Vt.; Oscar L. Olson, Montpelier, Vt., general contractor.

REINFORCING BARS PENDING

694 tons, including 677 tons bars and 17 tons mesh, building No. 44, Nash Motors Division, Nash-Kelvinator Corp., Kenosha, Wis.; bids Aug. 7.

600 tons, plant, Oscar Mayer & Co., Davenport, Iowa.

525 tons, state bridges, Union county, New Jersey; bids to be opened by the state highway department, Trenton, N. J., Aug. 21.

500 tons, plant, Nekoosa-Edwards Paper Co., Nekoosa, Wis.

500 tons, Western Electric Co. warehouse, Seattle; base bids in.

400 tons, high school, Weston, Wis.

300 tons, approaches to Pasco, Columbia river, Washington state highway bridge; bids to Olympia, Aug. 14.

300 tons, new plant, Allis-Chalmers Mfg. Co., Terre Haute, Ind.

200 tons, Minnesota Valley steam plant, Granite Falls, Minn.

190 tons, state bridges, Cumberland and York counties, Pennsylvania; bids to be opened by department of highways, Harrisburg, Pa., Aug. 24.

150 tons, office and operations building, Elgin, Joliet & Eastern Railroad, East Joliet, Ill.

143 tons, building, Phoenix Trimming Co., Chicago; bids in.

106 tons, armory, Illinois National Guard, Macomb, Ill.; bids in.

100 tons, water supply, Riverside, Ill.

100 tons, foundations, building No. 45, Nash Motors Division, Nash-Kelvinator Corp., Kenosha, Wis.

100 tons, or more, 240-foot Montana state Dodson-Malta highway bridge; general contract to Kiely Construction Co., Butte, low $149,[illegible].

100 tons, state bridges, Allegheny county, Pennsylvania; bids to be opened by the state highway department, Harrisburg, Pa., Aug. 24.

Unstated, water and sewage treatment facilities, Ladd air field, Alaska; general contract to S. Macri Construction Co., Seattle, and A. G. Rushlight, Portland, Oreg., joint low $1,839,659.

Unstated, laboratory, Armour & Co., Kankakee county, Illinois; bids Aug. 30.

Unstated, hospital and nurses home, Hinsdale, Ill.; bids Aug. 28.

Unstated, high school, St. Charles, Ill.; bids Aug. 22.

Unstated, apartment building, Chicago; bids Aug. 17.

Unstated, Memorial hospital, Rockford, Ill.; bids Aug. 16.

Unstated, factory and office building, International Register Co., Niles, Ill.; bids Aug. 13.

PLATES . . .

PLATES PENDING

150 tons, 16 inch by 35 feet by ⅜ inch sheet steel piling; bids to Bonneville Power Administration, Portland, Oreg., Aug. 16, Spec. #5979.

PIPE . . .

CAST IRON PIPE PENDING

Unstated, 12 inch water supply line; Valley Construction Co., Seattle, low $59,363, to Veterans' Administration, Seattle.

RAILS, CARS . . .

LOCOMOTIVES PENDING

Missouri Pacific Lines, 83 diesel-electric locomotives, comprising 126 units; purchase authorized by United States District Court, St. Louis.

RAILROAD CARS PLACED

Canadian National Railways, 125 seventy-ton covered hopper cars, to Canadian Car & Foundry Co., Montreal; 30 baggage cars to National Steel Car Corp., Hamilton, Ont.

Southern, 300 seventy-ton hopper cars, to Butler, Pa., plant of Pullman-Standard Car Mfg. Co., Chicago.

Atchison, Topeka & Santa Fe, 150 seventy-ton gondolas, to its Cleburne, Kans., shops.

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Metalworking Briefs . . .

CONSTRUCTION—ENTERPRISE—ORGANIZATIONAL CHANGES

Machine Tool Needs Studied

Survey of Air Force requirements for metalworking machinery is being conducted by N. A. Lougee & Co. Inc., industrial engineer, New York, for the Air Materiel Command. The Lougee firm is employing field representatives to visit machine tool builders holding Air Force contracts. They will visit also the plants of subcontractors supplying the machine tool builders.

Increases Stampings Output

A new stamping line has been put into operation at Ford Motor Co.'s stamping plant in Buffalo. It is turning out automobile doors. Plans call for starting other stamping lines within the next several months. The huge plant has attained about one-third capacity operation.

Will "Machine" Carbides

Method X Co., Philadelphia, an affiliate of Firth Sterling Steel & Carbide Corp., McKeesport, Pa., has a new electromechanical process for "machining" carbides and other hard and heat-resisting materials.

Dunn Steel-Townsend Merge

Merger of Dunn Steel Products Co., Plymouth, Mich., into the Townsend Co., New Brighton, Pa., became effective Aug. 1. Dunn Steel will be operated as a division of Townsend. George H. Haarbauer, formerly with Brainard Rivet Co., Warren, O., is general manager of the division. Townsend is a producer of rivets, special nails, locknuts and wire products.

Baldwin Plans Machine Shop

Baldwin Bros. petitioned the Erie, Pa., city council for reclassification of property at the corner of 21st street and Baur avenue from residential to light industry. The firm plans erection of a machine shop on the site.

Offers Bamag Equipment

General Industrial Development Corp., New York, was appointed agent in the United States and Canada for Bamag-Meguin, A. G., manufacturer and designer of industrial process equipment. Activities will be concentrated initially on equipment for manufacturing fertilizers, acids, nitrogen, hydrogen and other gases. Emphasis also will be given to gas generating and converting, ammonia processing, coal and coke treatment, sulphur recovery and the distillation and refining of oil fats. Later plans will bring the entire Bamag process line to this country, including blast furnace and steel equipment, foundry products and railroad materials.

Ansco Plans Expansion

Ansco will erect a warehouse, a pilot casting plant and an addition to its power plant as part of a $4 million expansion program in Binghamton, N. Y. The pilot casting plant will include considerable new machinery.

Hy-Pro Tool Co. Moves

Hy-Pro Tool Co., subsidiary of Continental Screw Co., now occupies its own building adjacent to the parent company in New Bedford, Mass. Hy-Pro manufactures a line of high-speed, high production, precision ground steel taps, slotting saws and metal cutting tools.

I. T. & T. Buys Coolerator

Coolerator Co., Duluth, was purchased by International Telephone & Telegraph Corp., New York, from Gibson Refrigerator Co., Greenville, Mich. The Duluth firm makes refrigerators, home freezers and electric ranges.

Opens Houston Warehouse

Morse Twist Drill & Machine Co., New Bedford, Mass., opened a warehouse at 5093 Navigation Blvd., Houston.

Kilby Steel Co. Expands

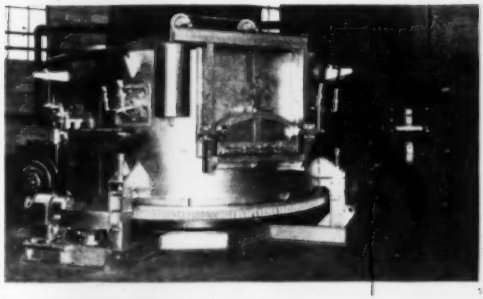
Loftus Engineering Corp., Pittsburgh, was awarded a contract by Kilby Steel Co., Anniston, Ala., for two heating furnaces and two heat treat lines for forging and treating 105 mm shells. Loftus also is supplying the fuel oil system, fire protection, and quench oil storage facilities.

Geneva Forge Enlarges Plant

Production will get under way within a month on a major defense contract at Geneva Forge, Geneva, N. Y. The contract calls for more than 2 million rocket fin blades. Heavy machinery for the new order is being installed. A 60,000 square foot addition to the plant is being constructed.

Curtiss Wright Buys Plant

Stockholders of Buffalo Stainless Casting Corp., Buffalo, approved sale of the corporation plant to Curtiss Wright Corp., New York.



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FOR ALL INDUSTRIAL USES
SEND FOR CATALOG No. 35
ARCHITECTURAL GRILLES
DIAMOND MFG. CO.
BOX 32 WYOMING, PA.

The latter company already had signed the contract to purchase the plant for $565,000 and will take over the building immediately. Buffalo Stainless Casting will be dissolved as a corporation.

Metal Carbides Opens Plant

Metal Carbides Corp., Youngstown, opened a new sales office, warehouse and service plant at 20485 Van Dyke, Detroit. Stock of products carried include cutting tools, tips, centerless grinder blades, lathe centers, drill jig bushings and solid carbide strips, rods, tubes and bar stock. A. B. Christman is in charge of the Detroit operation.

Chicago Steel Service Moves

Chicago Steel Service Co. moved to new quarters at Kildare avenue at 45th St., Chicago 32.

Barrett To Build Laboratory

Contract to build an applications research laboratory building for Barrett Division, Allied Chemical & Dye Corp., New York, was awarded to H. K. Ferguson Co., Cleveland. Included in the contract is an addition to an existing laboratory building. Total cost of the project is about $500,000.

Miller Electric Co. Expands

Miller Electric Mfg. Co., Appleton, Wis., is engaged in an expansion program to increase production facilities and to provide space for new machinery, an enlarged shipping department and additional offices.

Builds Aircraft Parts Plant

Aircraftsmen Co. Inc., 223 Hindry Ave., Inglewood, Calif., is constructing a $100,000 aircraft parts manufacturing plant at 1656 West 134th St. Al P. Clausen is president.

Fuller Tool Co. Moves

Fuller Tool Co., organized in 1945, is now located in a new plant at 4000 W. Eleven Mile Rd., Berkley, Mich. The company specializes in the manufacture of high-speed steel and carbide-tipped cutting tools. Close tolerance aircraft parts requiring screw machine work, milling, fine finish grinding, lapping and honing also are manufactured.

Buys Refractories Producer

Charles Taylor Sons Co., producer of refractories for metallurgical and glass industries, Cincinnati, was acquired by National Lead Co., New York, in a deal involving about $1.5 million. Taylor refractories plants are located in Taylor, Ky., and Cincinnati. National Lead intends to operate the Taylor company as a wholly-owned subsidiary and will retain present officers. National Lead has been interested for many years in the refractory field as a producer and refiner of zircon. The parent company has a refractory plant at Niagara Falls, N. Y., which is used to develop materials and methods for other refractory manufacturers.

Enters Transformer Industry

Transformers Inc., a newly formed firm in Binghamton, N. Y., received about $100,000 worth of Army and Air Force defense orders and is seeking factory space for expansion. The firm assembles transformers.

Greene Stamping & Machine

Greene Stamping & Machine Co. was formed in Greene, N. Y., and will begin production activities shortly. The company, capitalized at $250,000, has a new plant building. It will engage in subcontract work of defense orders.

Awards Welding Franchises

Nelson Stud Welding Division, Gregory Industries Inc., Lorain, O., awarded to Elwin G. Smith & Co., Pittsburgh, and Braden Steel Corp., Tulsa, Okla., franchises to use its method of installing cofrugated asbestos, aluminum and steel roofing and siding materials.

Will Remodel Ordnance Plant

Naval Industrial Reserve Ordnance plant, Rochester, N. Y., will be remodeled at a cost of about $300,000. The plant, known as the old Symington foundry, is being operated for the Navy by Eastman Kodak Co., that city.

Chatco To Build Components

A. V. Roe Canada Ltd. announced jointly with Chatco Steel Products Ltd. that Chatco would begin almost immediately to build major components for long-range jet fighters at Tilbury, Ont. Tooling and installation of equipment for the multimillion dollar job has started.

Expands Sales Organization

American Cladmetals Co., Carnegie, Pa., is expanding its sales engineering organization. The company announced these new sales territory appointments: New England area, Wetherell Bros., Cambridge, Mass., under the supervision of J. P. Larkin; New York and Philadelphia metropolitan areas, Engineered Sales Co., Summit, N. J., under the direction of John H. O'Sullivan; northern Pennsylvania and up-state New York, William

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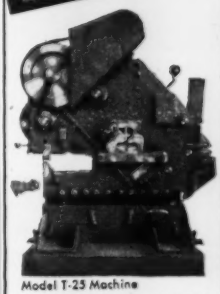

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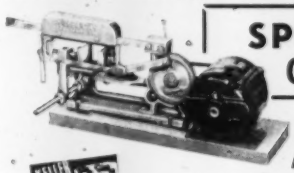

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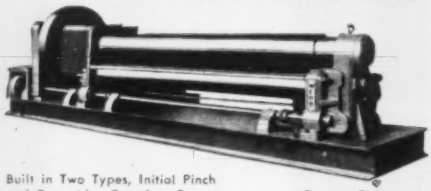

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Hubbell Metals Inc.

Brass & Copper Sales Co., a St. Louis firm with branches in Kansas City, Mo., and Indianapolis, changed its name to Hubbell Metals Inc. The company is a distributor of aluminum, steel, stainless steel, brass and copper products; fasteners; and a line of refrigeration and air-conditioning supplies.

Trade Group Builds

An unusual structure a building specially designed for trade association occupancy is being built by National Screw Machine Products Association at 2860 E. 130th St., Cleveland. The $100,000 facility will have 6000 square feet of floor space and is expected to be finished by the first of next year. The association's address until then will continue to be 13210 Shaker Square, Cleveland.

Sylvania Buys Borden Plant

Sylvania Electric Products Inc., New York, purchased the Borden Co. plant in Troy, Pa., and will operate it as a branch plant of the tungsten and chemical operation in Towanda, Pa. The Troy plant is being renovated with production set to begin in the fall. It has 35,000 square feet of floor space.

Durez Plans Phenol Plant

Durez Plastics & Chemicals Inc., North Tonawanda, N. Y., will double its production of phenol by erecting a second phenol plant costing $6,371,333 at a site yet to be selected.

Offers Welding Equipment

Dayton, O., branch of Burdett Oxygen Co., Cleveland, will serve as distributor for a complete line of General Electric welding equipment. Future plans include construction of an additional building to house an acetylene generator. Karl Bird is in charge of Dayton operations.

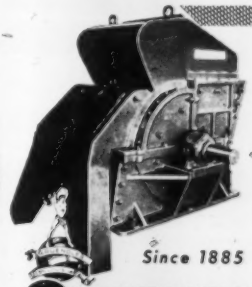
Ford Buys Land Near Toronto

Ford Motor Co. of Canada Ltd., Windsor, Ont., is taking up its options on 427 acres of land about 20 miles west of Toronto, Ont.

Operates New Furnace

A new furnace is being operated at Electro Metallurgical Co.'s plant in Niagara Falls, N. Y. The furnace is the last of four units installed in an expansion program launched following World War II.

DEBUT IN MARCH: A copper box containing mementos of Norton Co.'s 51 years in the grinding machine business was set in the cornerstone for a new buildng at Worcester, Mass., scheduled for completion in March, 1952. The grinding machine division's new plant will consist of a 6½-acre single-story factory adjoining a 100 x 360 foot office building. Spreading mortar is Carl Ahlstrom, retired 50-year man in the Norton division. Assisting, left to right: Frank W. Smith, vice president; Andrew B. Holmstrom, company vice president and mayor of Worcester; and Milton P. Higgins, president



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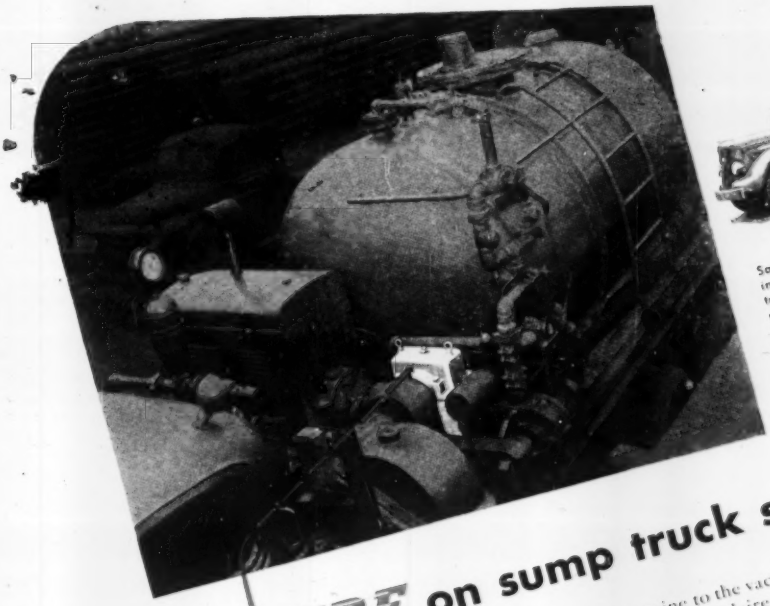


Saving weight and space was vital in the building of this vacuum tank truck—used to pump and haul away mud, water and waste oil from sump holes at drilling wells and refineries. Speedaire helped solve that problem. Photo courtesy of Associated Oil Co. of California.

SPEEDAIRE on sump truck saves $315

POWER is transmitted from the engine to the vacuum pump of this oilfield sump truck by a Speedaire unit. For this special job, a fan-cooled speed reducer is ideal. It affords a 3-way saving: it saves 650 pounds, or 54% of the weight; saves 6.1 cubic feet, or 61% of the space occupied; saves $315, or 34% of the initial cost of a conventional worm-gear drive.

Speedaire is Cleveland's fan-cooled worm-gear speed reducer. Because it is fan-cooled, Speedaire does more work—delivers up to *double the horsepower* of standard worm units of equal frame size, at usual motor speeds. It can be installed economically on many applications where other types have been used heretofore—giving you the advantage of a compact right-angle drive. Speedaire gives the same long, trouble-free service characteristic of all Cleveland's.

For full description, send for Catalog 500. The Cleveland Worm & Gear Co., 3270 E. 80th St., Cleveland 4, O.

Affiliate: The Farval Corporation, Centralized Systems of Lubrication.
In Canada: Peacock Brothers Limited.

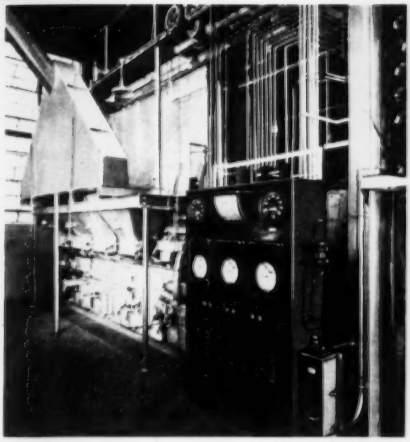
CLEVELAND
Worm Gear
Speed Reducers

Choice of the Leaders

CUTLER-HAMMER
MOTOR CONTROL
C-H

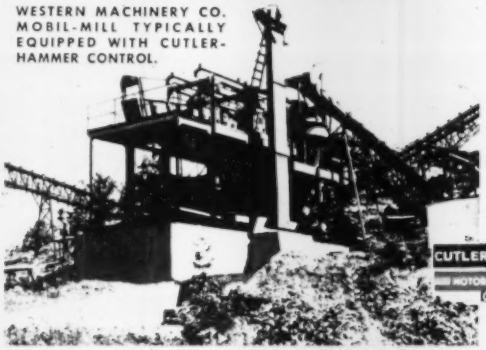
The Mark of Better Machines

CLEARING MACHINE CORPORATION DRAW PRESS 100% EQUIPPED WITH CUTLER-HAMMER MOTOR CONTROL

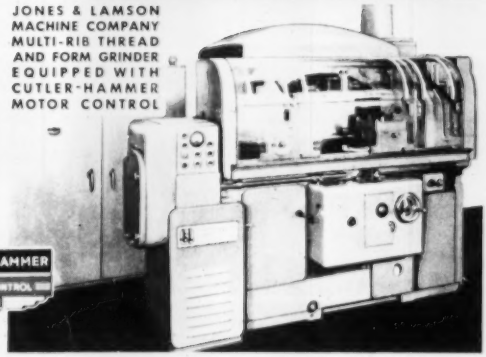


DETROIT STOKER INSTALLATION. CONTROL IS 100% CUTLER-HAMMER

WESTERN MACHINERY CO. MOBIL-MILL TYPICALLY EQUIPPED WITH CUTLER-HAMMER CONTROL.



JONES & LAMSON MACHINE COMPANY MULTI-RIB THREAD AND FORM GRINDER EQUIPPED WITH CUTLER-HAMMER MOTOR CONTROL



Good, Better, Best...

There is no such thing as a *bad* product of any kind on the American market; competition is too severe for a poor product to exist. But there *are* degrees of merit. Some products are recognized as better than other products. And some few in every field are widely accepted as the *best*. Their makers are acknowledged leaders and their names have become buy-words for assured satisfaction. This position of commercial advantage is neither easily won nor held without a policy of scrupulous attention to every detail influencing product performance in the user's hands. In accepting this obvious fact no thinking person can fail to be moved by the force of the evidence that Cutler-Hammer Motor Control is so frequently and continuously the choice of the nation's leading machinery manufacturers. You too will find it pay to insist on Cutler-Hammer Motor Control . . . . . CUTLER-HAMMER, Inc., 1211 St. Paul Avenue, Milwaukee 1, Wisconsin. *Associate:* Canadian Cutler-Hammer, Limited, Toronto, Ontario.